



Maintenance Accountability Process

Manual



Washington State Department of Transportation
Field Operations Support Service Center
Maintenance Office

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Map Manual

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Chapter 1

Introduction

Background

In 1996 the Washington State Department of Transportation embarked on an initiative to employ outcome based performance measures for evaluating the effectiveness of the Maintenance Program. The Maintenance Accountability Process, or MAP as it has become known, is a comprehensive planning, measuring, and managing process that provides a means for communicating to key customers the impacts of policy and budget decisions on program service delivery.

History

Previously, budgeting for the maintenance program was an incremental process, based on historical expenditures, with small additions for approved decision packages. Across the board cuts were common place because of a lack of understanding of the base program. During the 1995 Legislative session, legislators struggled to understand the impacts of several budget scenarios on the statewide program. WSDOT staff was unable to adequately communicate possible trade-offs and identify the impacts of several alternative investment options.



Questions about Highway Maintenance

Out of frustration, the Legislature finally decided to reduce the program budget from previously funded levels and directed WSDOT to undertake a study to evaluate the effectiveness and efficiency of maintenance and improve program accountability. WSDOT hired a consulting team lead by Dye Management Group, Inc. to complete the analysis. The consulting team completed the study in June, 1996 and provided the basis for implementation of the Maintenance Accountability Process.

The 1997 Legislative session was the first time MAP tools were utilized to support the budget request for the maintenance program. WSDOT was able to identify investment choices and the affects of those choices on the program. WSDOT was the first agency in the state to utilize performance based budgeting. The MAP has since become a model not only for Washington State, but for highway maintenance programs in many other states.

Performance Budgeting Pilot Project

In 1998 the 55th Legislature placed an emphasis on the accountability of state agencies through improved effectiveness and efficiency. The legislature directed all transportation agencies to establish a performance based budgeting process. An initial step would be for each agency to designate a program to pilot performance budget tools for analysis and development of their budget for the 1999-01 biennium. The Washington State Department of Transportation selected the M2 subprogram of the Highway Maintenance and Operations (M) Program as the pilot project because of the early success with the MAP. Today, MAP is an integral part of budget preparation, work planning and implementation of M Program goals.

MAP Basics

The MAP is a continuous improvement process that is consistent with WSDOT's Strategic Plan. It provides the tools to link strategic planning, the budget, and maintenance service delivery. It essentially provides the means for evaluating the effectiveness of the program, and program accountability.

Program analysis is accomplished through the use of sampling procedures that record results of work accomplished with key maintenance activities. Some of the data is collected using statistically valid, randomly chosen sites for Field Surveys. Other data is collected from records of work accomplished. Utilizing outcome based performance measures and a service level scale (A through F), service delivery results can be rated against established benchmarks. Over time, service levels trends can also be charted. One of the key MAP tools is the MAP Priority Matrix. The Matrix prioritizes maintenance activities and ranks them according to their contribution to maintenance program goals. This document is periodically reviewed and updated to ensure the reflection of these goals.

The MAP, through its component pieces, provides WSDOT the means to clearly communicate to its key customers, the Legislature, the Governor, the Transportation Commission and ultimately the tax paying public, the impact of policy and budget decisions on program service delivery.

Chapter 2

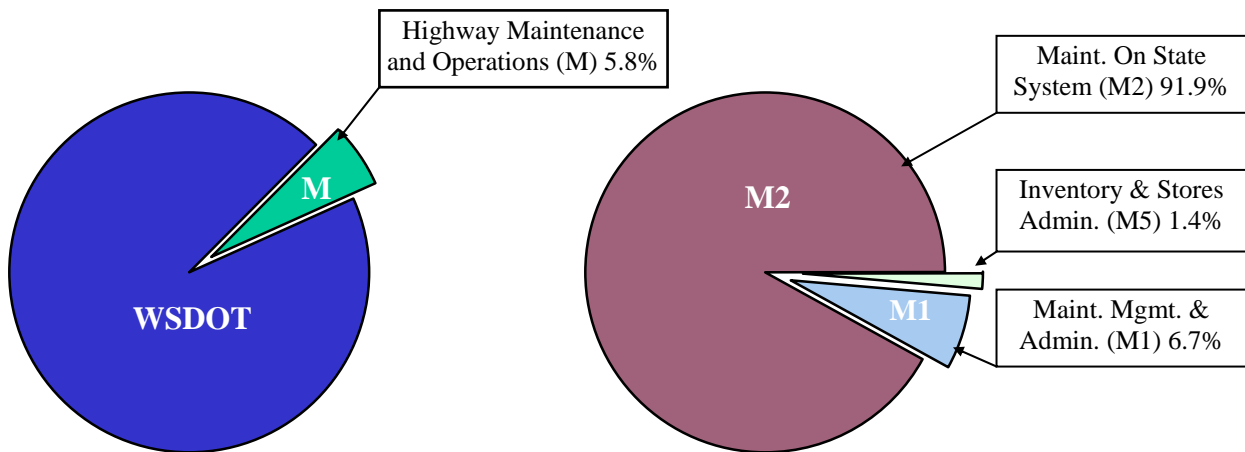
Structure

Program M - Highway Maintenance and Operations

The overall goal for Maintenance, as contained in the **State Highway Systems Plan**, is to “retain the highway system in a condition as near as possible to the condition of its initial construction or subsequent improvement”. The state highway system consists of:

- Over 7,000 miles of highway
- 10 year-round mountain passes
- 43 rest areas, 2 of which are maintained cooperatively with another entity
- Over 3,100 bridges

The M Program is the Maintenance “piece of the pie”. In the 2005-2007 biennium, the M Program accounted for 5.8% of the total WSDOT budget.



This piece of pie is then divided into three subprograms, shown in the pie chart above and defined below:

Subprograms

M1 - Maintenance Management and Administration (6.7% of M)

All expenditures of a management or administrative nature that are directly related to maintenance and operation of the highway system, and cannot be directly distributed to specific maintenance activities.

M2 - Maintenance on State System (91.9% of M)

All expenditures for activities related to maintenance and operation of the highway system and associated facilities so that it substantially retains its original intended use and function.

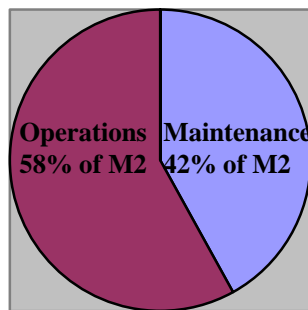
M5 - Inventory and Stores Administration (1.4% of M)

All expenditures for management and administration of necessary materials and supplies for maintenance and operations of the highway and associated facilities. This includes ordering, receiving, storing, issuing, and disposing of items such as: signs, stock piled sand and gravel, guardrail posts, traffic cones, and herbicides.

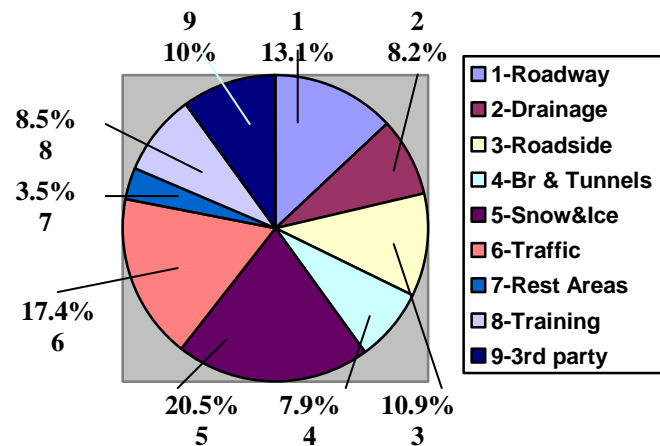
M2 Subprogram - Maintenance on State System

The M2 Subprogram, Maintenance on State System, is the subprogram that MAP was developed for. It is divided into two components, distributed across nine basic work groups. Each group may contain activities pertaining to both Maintenance and Operations. The following charts indicate how M2 dollars were spent in the 05-07 biennium, by component and group.

M2 Components



M2 Groups



Components

(A) Maintenance (42% of M2)

This component consists of work that is performed to care for and maintain the highway and associated facilities so that it substantially retains its original intended use and function.

Examples:

1. Pavement patching and repairing pot holes
2. Cleaning ditches and culverts so they retain design capacity for drainage
3. Controlling vegetation so it does not block signs or obstruct intersections
4. Painting stripes on the roadway surface

(B) Operations (58% of M2)

This component covers activities performed to operate the highway and associated facilities. Generally these activities affect the reliability of a direct service to customers using the highway, a facility, or a system.

Examples:

1. Rest area operations
2. Reversible lane gate, highway lighting and traffic signal system operation
3. Snow and ice control to keep highways operational during the winter storms
4. Disaster operations to keep highways or detours operational during a disaster

Groups

Groups contained in the M2 Program are the maintenance functions needed to maintain the highway system. Each of these groups has associated MAP activities assigned according to which portion of the highway system they affect. They consist of:

Group 1 - Roadway Maintenance & Operations (13.1% of M2)

A – Roadway Maintenance

1A1 - Pavement Patching, Repair & Crack Sealing
1A3 - Shoulder Maintenance
1A4 - Sweeping & Cleaning

B – Roadway Operations

1B1 – Safety Patrol

Group 2 - Drainage Maintenance & Slope Repair (8.2% of M2)

A – Drainage Maintenance

2A1 – Maintain Ditches
2A2 – Maintain Culverts
2A3 – Maintain Catch Basins & Inlets
2A4 – Maintain Detention/Retention Basins
2A5 – Slope Repair

Group 3 - Roadside & Vegetation Management (10.9% of M2)

A – Roadside & Veg Mgmt Maintenance

3A1 – Litter Pickup
3A2 – Noxious Weed Control
3A3 – Nuisance Vegetation Control
3A4 – Control of Vegetation Obstructions
3A5 – Landscape Maintenance

Group 4 - Bridge & Urban Tunnel Maintenance & Operations (7.9% of M2)

A – Bridge & Tunnel Maintenance

4A1 – Bridge Deck Repair
4A2 – Structural Bridge Repair
4A3 – Bridge Cleaning

B – Bridge & Tunnel Operations

4B1- Moveable & Floating Bridge Ops
4B2 - Keller Ferry Operations
4B3 – Urban

Group 5 - Snow & Ice Control Operations (20.5% of M2)

B – Snow & Ice Operations

5B1 – Snow & Ice Control Operations

Group 6 - Traffic Control Maintenance & Operations (17.4% of M2)

A – Traffic Control Maintenance

6A1 – Pavement Striping Maintenance
6A2 – Raised/Recessed Pvmnt Marker Maint
6A3 – Pavement Marker Maintenance
6A4 – Regulatory Sign Maintenance
6A5 – Guide Sign Maintenance
6A6 – Guidepost Maintenance
6A7 – Guardrail Maintenance

B – Traffic Control Operations

6B1 - Traffic Signal Systems
6B2 – Highway Lighting Systems
6B3 – Intelligent Transportation Systems

Group 7 - Rest Area Operations (3.5% of M2)

B – Rest Area Operations

7B1 – Rest Area Operations

Group 8 – Training & Testing (8.5% of M2)

B – Training & Testing (Operations)

8B1 – Employee Technical & Safety Training

8B2 – Support & Testing

Group 9 - 3rd Party Damages & Disaster Operations (10% of M2)

B – Training & Testing (Operations)

9B1 – 3rd Party Damages

9B2 – Disaster Operations

Chapter 3

MAP Activity Descriptions and Operation Numbers

MAP Activity Descriptions and Work Operations **Chapter 3**

This chapter is all about the MAP activities and associated work operations. Each activity is defined and examples of tasks, crew size, equipment used, appropriate work operations and much more can be found here.

MAP Activity numbers indicate which component and group they are a part of. The first character signifies the group, the second signifies the component and the third is simply the order of activities within a particular group. For instance, let's look at 1A3, Shoulder Maintenance. The number 1 tells us this activity is in Group 1, Roadway Maintenance & Operations. The letter A informs us that this activity is considered part of the Maintenance component. Lastly, the number 3 indicates this is the third item in Group 1.

New performance measures are being created for reporting the level of service provided for preventive maintenance activities on several different elements, such as Signals and ITS. These activities will fall under the Operations component, are identified (at this time) by the letter C as the second character in the MAP Activity number, and are included in this manual for informational purposes only. Reporting processes for these activities are not yet in place.

General Notes:

1. The crew size and equipment identified for each activity is representative of what would most commonly be used in each situation. Others may be selected, when in the judgment of trained maintenance personnel, it is determined that other methods are necessary for safe, cost effective, and expeditious execution of the activity.
2. The crew size for many maintenance activities can vary from 1 to 6 people because additional traffic control may be needed to insure a safe work site. Many activities require one or more buffer trucks with a truck mounted attenuator and arrow boards. Highways that have high traffic volumes, are in urban locations, or have extensive curves with low visibility will require additional workers for traffic control purposes.

Group 1 - Roadway Maintenance & Operations

1A1 - Pavement Patching, Repair & Crack Sealing

Activities required to fix pavement deficiencies such as pot holes, alligator cracking, and rutting in order to extend the life of the pavement. Work may include digging out old broken pavement, any unstable base material, and placing and compacting new, free draining, base material and asphalt mix with mechanized equipment or hand tools depending on the size of the patch. For large areas of deficient pavement, an asphalt distributor spraying hot liquid asphalt or emulsified asphalt on the distressed pavement area, and covering it with crushed rock and rolling the rock to compact and seat the stones together, or an overlay patch with hot-mix asphalt may be used. This activity also includes grading and repairing gravel roads, repairing broken curbs, and engineering services for special, roadway-related projects. Crews doing this work may vary from 2 to more than 10 people, depending on the size of the repair and amount of equipment needed to accomplish the work. Equipment may include dump trucks, front end loader, motor grader, paving machine, steel roller, rubber tire roller, chip spreader, oil tank trailer and/or an oil distributor.

This activity also includes crack sealing, which is repairing cracks in asphalt and concrete pavement in order to extend the life of the pavement. Random cracking will appear in pavements due to natural aging and traffic action. Cracks over 1/4 inch wide should be filled to prevent water from entering into and weakening the underlying subgrade. Crack sealing is accomplished by pouring hot liquid asphalt in the cracks. Crews doing this work may vary from 2 or more people, depending on the amount of cracking and amount of equipment needed to accomplish the work. Equipment may include dump trucks, compressor, and asphalt kettle.

1A3 - Shoulder Maintenance

Activities required to repair deficiencies in the paved shoulder or gravel area adjacent to the edge of the pavement. Includes all activities listed above for pavement patching and crack sealing, but also includes grading the gravel to repair erosion or a drop-off developed by vehicles driving off the pavement edge, and removing shoulder buildup caused by vegetation growth, or sand left from winter work. Crews doing this work may vary from 1 to 4 people, depending on the size of the repair and amount of equipment needed to accomplish the work. Equipment may include a motor grader for the grading work and a sweeper for clean up, or all the equipment listed for pavement patching and crack sealing.

1A4 - Sweeping & Cleaning

Includes sweeping paved shoulders and paved islands either by hand or with a self propelled mechanical sweeper. The work may include picking up all debris, hauling it to a nearby waste disposal site, and washing the pavement with a street flusher. Crews doing this work may vary from 1 to 6 people depending on the amount of traffic control needed. Equipment may include dump trucks, sweeper and street flusher.

1B1- Safety Patrol

Includes patrolling the highway to ensure that the roadway, shoulder, and right of way are free of hazards to the traveling public or hazards that may jeopardize the roadway or roadway prism. Work includes traveling the roadway to inspect for hazardous conditions or problems. Situations requiring immediate attention include rocks, debris, downed stop signs, or dead animals on the roadway. These are corrected without delay to minimize the traveling public's exposure to the hazard. Any conditions that require a crew or special equipment, such as damaged guardrail, a sign down, a rock slide, or wind-blown tree that has encroached on the roadway are reported to the area maintenance office for future scheduling of crews. Safety patrols are routinely accomplished in areas that commonly have problems, such rockfall or slide areas, and high volume roadways where there is more likelihood of damage occurring or having debris on the roadway.

This activity also includes responding to complaints from the public or the State Patrol about hazards reported to the area office. Each complaint/identified problem must be inspected to determine the severity of the problem and the appropriate remedy. Situations requiring immediate attention are corrected without delay to minimize the traveling public's exposure to the hazard. The work is normally accomplished by one person in a truck.

Group 2 - Drainage Maintenance & Slope Repair

2A1- Maintain Ditches

Includes all work necessary to remove silt, soil and rock that have built up over time to restore the flow capacity of ditches. Work may include placing rock in ditches that have eroded to restore the original flow lines and control future erosion. Re-vegetation of the cleaned ditch may also be implemented to control future erosion. Material that is removed from the ditch must be hauled to a suitable disposal site. Crews doing this work may vary from 1 to more than 7 people depending on the size of the repair and amount of equipment needed to accomplish the work. Equipment may include dump trucks, front end loader, motor grader, belt loader, excavator, or backhoe.

2A2 - Maintain Culverts

Includes all work necessary to keep culverts that cross state highways free of debris and silt. Also includes removing debris build-up, beaver dams, or brush at culvert ends to insure they are free of obstructions. Crews doing this work may vary from 2 to 4 people depending on the size of the obstruction. Equipment may include a culvert rodder, dump truck, backhoe, double drum dragline and hand tools.

2A3 - Maintain Catch Basins & Inlets

Includes all work necessary to restore flow and storage capacity of inlets, catch basins, manholes, and connecting pipes. Work includes removing the lid and extracting built-up debris and silt. Crews doing this work may vary from 2 to 4 people depending on the amount of traffic control required. Equipment may include a vacuum truck, culvert rodder, water tank truck, dump truck, truck mounted attenuator, and hand tools.

2A4 - Maintain Detention/Retention Basins

Includes all work necessary to remove soil and silt build-up in retention and detention basins. Material that is removed from these basins must be hauled to a suitable disposal site. Crews doing this work may vary from 4 to more than 7 people, depending on the size of the repair and amount of equipment needed to accomplish the work. Equipment may include dump trucks, front end loader, excavator, or backhoe.

2A5 - Slope Repair

Includes all work necessary to repair slope damage from slides, drifting sand or erosion. Work also includes repairing damage to riprap, cribbing, bulkheads, and dikes. For slide repair, the rock, mud, or dirt that has slid into the ditch or on the roadway must be removed and the ditch returned to its original shape. Erosion repair will involve replacing the eroded material with rock, gravel or other material to stabilize the slope and restore it to its original shape. It may also require removing the eroded material if it has caused damage to adjoining land. Re-vegetation of the slope may also be implemented to control future slope damage. The crew size will vary greatly depending on the size of the slide or damage that has occurred and the amount of equipment needed to do the work. Equipment may include dump trucks, front end loader, excavator, or backhoe.

Group 3 - Roadside & Vegetation Management

3A1 - Litter Pickup

Includes all work necessary to remove litter, debris, and dead animal carcasses from the shoulder and roadside, and haul it to an appropriate disposal site. Also includes administration of the Adopt-A-Highway Litter Control Program including providing safety hats and vests, signs, and litter sacks to the groups and collecting the filled sacks and hauling to an appropriate disposal site. Work requires one or two people with a small truck, dump truck or garbage compactor.

3A2 - Noxious Weed Control

Includes all work necessary to eradicate and prevent the spread of seed from weeds identified in WAC 16-750 as a Class A or B noxious weed and growing on highway rights of way. The work may involve the spraying of herbicides, mowing, hand pulling, or application of biological control agents (bugs or diseases). The work also includes preventive strategies such as seeding, planting, fertilizing, or liming to enhance desirable vegetation communities which will out-compete unwanted weeds. Work is accomplished by one or two people using power spray equipment, or mowers. A buffer truck may be necessary for traffic control safety.

3A3 - Nuisance Vegetation Control

Includes all work necessary to eradicate nuisance vegetation on the right of way that is not identified in WAC 16-750 as a Class A or B noxious weed, nor considered a safety hazard from a highway operational standpoint. This type of vegetation is either aesthetically unsightly, or is troublesome. Scotch Broom and blackberries are two plants that typically fall into this category on the west side of the state. Morning Glory and Puncturevine are examples for the east side. This work includes general mowing of the roadside to improve neatness and appearance. The work may involve the spraying of herbicides, mowing, brushing with hand tools or power saws, pulling by hand, or application of biological control agents (bugs or diseases). Also includes application of soil residual herbicides to prevent vegetation from growing in the gravel at the edge of the pavement. Work is accomplished by one to eight or more people depending on the amount and size of the project. Equipment may include dump trucks, bucket truck, power spray equipment, mowers, or spyder with a brush head. A buffer truck may be necessary for traffic control safety.

3A4 - Control of Vegetation Obstructions

Includes all work necessary to eliminate vegetation on the right of way that is, or potentially will be, a safety hazard from an operational standpoint. This type of vegetation is either an obstruction to a vehicle leaving the highway that would cause damage if struck, or is an obstruction to the vision of motorists using the highway and would prevent someone from seeing an upcoming hazard and not allow adequate time to prevent an accident. The work also includes keeping sight lines to signs open; removal of trees and brush that shade the roadway causing icing conditions during the winter; removal of vegetation that is a potential fire hazard; and removal of trees that exhibit structural flaws which increase potential for failure and falling on the roadway. Also includes removal of trees that have fallen on the road after a snow or wind storm.

Obstructions can include danger trees, trees 4 inches in diameter or larger in the clear zone, and vegetation blocking regulatory, warning and advisory signs. Other hazards included in this work group are vegetation blocking sight lines to ditch lines, guardrail, guideposts and private approaches. Potential obstructions are seedling trees that are not large enough to be a hazard but will be so in the future.

The work may involve the spraying of herbicides, mowing, brushing with hand tools or power saws, pulling by hand, or application of biological control agents (bugs or diseases). This group does not include preventive strategies such as seeding and fertilizing. Work is accomplished by one to

eight or more people depending on the amount and size of the vegetation removed. Equipment may include dump trucks, bucket truck, power spray equipment, mowers, spyder with a brush head, chipper, chain saw, pole saw, or hand tools.

3A5 - Landscape Maintenance

Includes all activities related to the care of formal, ornamental landscape plantings along the highway and interchanges. Work includes weed prevention and eradication; operation and repair of irrigation systems; fertilizing, liming, pruning, trimming and mowing of lawns. Crew size may vary from 1 to 6 people depending on the size of the area being cared for. Equipment may include backhoe, truck, herbicide and insecticide spray equipment, chain saw, hand tools, and fertilizer spreader.

Group 4 - Bridge & Urban Tunnel Maintenance & Operations

4A1 - Bridge Deck Repair

Includes all work necessary to repair scaling, spalling, cracks, and exposed reinforcing steel on bridge decks. The work includes saw cutting and removal of broken asphalt or concrete from the damaged area and patching it with an appropriate mix or compound such as asphalt, epoxy or concrete. Work requires a crew of 6-8 people with an air compressor, jackhammer, concrete saw, front end loader, and trucks. A buffer truck may be necessary for traffic control safety.

4A2 - Structural Bridge Repair

Includes all work necessary to repair deficiencies that affect the structural support systems of a bridge or tunnel. This includes a wide variety of work including repairing piers or girders, replacing bearing pads, replacing damaged or deteriorated truss members, replacing or repairing expansion joints, repairing scour around piers, and removing debris build-up against piers, bulkheads, or pilings. This may also include tunnel interior maintenance, maintenance of non-structural portions of the bridge (bridge rail, traffic gates, navigation lights, etc.), and payments to other states for inter-state bridge maintenance activities. Work requires a crew of 6-8 people with an air compressor, jackhammer, concrete saw, under-bridge bucket truck, backhoe, and dump trucks. A buffer truck may be necessary for traffic control safety.

4A3 - Bridge Cleaning

Includes all work necessary to clean bridge surfaces, sidewalks, and drains to remove sand and debris build-up, provide proper drainage, and an aesthetically clean appearance. Work includes sweeping and washing decks and sidewalks, power washing or sand blasting rust, moss, bird guano, or dirt from surfaces, and cleaning plugged drains and grates so water flows through them freely. This activity also includes painting steel structures to prevent rusting and present an aesthetically pleasant appearance. Work may require a crew of 6-8 people with an air compressor, power washer, sweeper, vactor truck, flusher truck, bucket truck, front end loader, and dump trucks. A buffer truck may be necessary for traffic control safety.

4B1 - Movable and Floating Bridges

Coast Guard regulations require that certain waterways be open to navigation at all times. Highway bridges that cross these waterways must either be high enough to allow ships and boats to pass underneath, or have the ability to move the span so ships and boats can pass on demand. This activity includes all work necessary to maintain and operate moving and floating bridges that are not covered in the activities listed above. Work includes maintenance of all mechanical and electrical working parts so the bridges can be opened and closed when needed. The activity includes the work operation of opening and closing the bridge span. Also includes work to operate floating bridges including pumping water out of pontoons and adjusting anchor cable tension. This work is necessary to keep the bridges operational, afloat, and in proper alignment. Work may require a crew of 1 or more people, and some must have special electrical and mechanical skills and licenses. Tools may include a variety of specialized electrical and mechanical equipment.

4B2 - Keller Ferry

Includes all work necessary to operate the Keller Ferry which crosses Franklin D. Roosevelt Lake (slackwater behind Grand Coulee Dam) and is a vital transportation link for agricultural commerce on SR 21 between the communities of Republic and Wilbur. The ferry (the "Martha S.") is a diesel powered barge-type boat that navigates the 1 1/2 miles, 18 hours a day, 365 days a year. The ferry is typically operated by a two-person crew that must be licensed by the U.S. Coast Guard

4B3 - Urban Tunnel Systems

Urban tunnels in the Seattle area contain a number of safety and operational systems that are deployed during high traffic periods to ventilate the tunnels, or apply fire suppressants in the event of a fire. These systems require periodic testing and operation. This activity includes all work necessary to insure all the mechanical, electrical, and electronic equipment such as exhaust fans, fire protection systems, carbon dioxide monitoring equipment, lighting, radio systems, and all other equipment including the computer control system is operational at all times. This work requires a crew of 14 to 17 technically trained personnel with specialized skills such as those found in the professions of electricians, plumbers/pipefitters, millwrights, and electronics technicians.

4C1 – Movable and Floating Bridge Preventive Maintenance

This activity includes all work necessary to perform preventive maintenance tasks on mechanical and electrical bridge systems, as identified by the manufacturer, or contained in the O&M Manual. These systems can be very complex and require preventive maintenance to ensure the longest lifecycle possible. Tasks are identified and scheduled for completion in MPET (Maintenance Productivity Enhancement Tool). Work will require a crew of 1 or more people, and some must have special electrical and mechanical skills and licenses. Tools may include a variety of specialized electrical and mechanical equipment.

4C3 - Urban Tunnel Systems Preventive Maintenance

This activity includes all work necessary to perform preventive maintenance tasks as identified by the manufacture, or contained in the O&M Manual for Urban Tunnel systems. This will include all mechanical, electrical, and electronic equipment such as exhaust fans, fire protection systems, carbon dioxide monitoring equipment, lighting, radio systems, and all other equipment including the computer control. These systems can be very complex and require preventive maintenance to ensure peak performance. Tasks are identified and scheduled for completion in MPET (Maintenance Productivity Enhancement Tool). This work requires a crew of 14 to 17 technically trained personnel with specialized skills such as those found in the professions of electricians, plumbers/pipefitters, millwrights, and electronics technicians.

Group 5 - Snow & Ice Control Operations

5B1 - Snow & Ice Control

During winter months from November through March, the primary focus of highway maintenance is keeping the highways operational by the removal of snow and ice, and the routine patrolling of the roadway for early detection of slides, icing, and other winter hazards. This includes 10 mountain passes that remain open year-round. On Snoqualmie and Stevens Passes, avalanche crews monitor and control potential avalanches before they are a hazard to the traveling public. Over the past few years, the Snow & Ice Program has moved toward a chemical program, using anti-icing chemicals or deicers more, and sand less. With better technology and better weather forecasting, the appropriate use of chemicals provides the means to keep highways clearer than plowing alone. Sand continues to be used when appropriate. Between snow storms, the crews in some areas may sweep up accumulated sand to reduce dust and minimize resulting air quality impacts. Highways are prioritized for snow and ice control based primarily on traffic volumes and functional class. Interstate and principal arterial highways with the highest average daily traffic within a given maintenance area, will normally receive the first attention. Since winter storms may occur at any time, during any day, with varying intensity, staffing schedules are adjusted to provide a broader coverage and offer better response to storm events. Crew sizes will vary depending on the number of lane miles for which they are responsible. Typical equipment may include dump trucks with a sander and a plow, motor grader, deicer tanker/truck, pickup truck, front end loader, or snow blower.

Group 6 - Traffic Control Maintenance & Operations

6A1 - Pavement Striping Maintenance

All highways have lines that delineate the travel lane for motorists. On multi-lane and two lane roadways this normally consists of a continuous edge stripe closest to the outside shoulder on each side, and a dashed centerline down the middle, to separate the roadway from oncoming traffic. On hilly and curved roads additional yellow stripes will define "No Passing" Zones. The combination of traffic, sand, dirt, and debris can wear these stripes away over time and they must routinely be replaced. The stripes may last anywhere from a month during the winter season to more than one calendar year depending on a combination of these factors. Stripes can be painted on the roadway, or be composed of thermoplastic or methyl methacrylate materials. Pavement striping normally requires a crew of six people. Equipment may include a paint truck, flat bed truck, van, and 2 or more trucks with a mounted attenuator.

6A2 - Raised/Recessed Pavement Markers (Buttons) Maintenance

On many highways, the lines that delineate the traffic lanes and other pavement markings are made up of individual pavement markers (RPM's) or buttons. On the west side of the state, these are installed directly on the pavement and have the added advantage of warning a motorist by sound when they are passing over them. This is important when the pavement is wet and painted lines are difficult to see. On the east side of the state, buttons are placed in recesses ground into the pavement, which places them slightly below the elevation of the pavement. This allows steel bit plows used for snow removal to plow over the RPM's without damaging them. RPM's are also used to supplement painted lines. Traffic dislodges the RPM's over time and they must routinely be replaced. Additionally, the reflectivity of RPM's decreases due to exposure to traffic and new RPM's must be installed even though the old ones are still in place. The RPM's are normally glued in place with a bituminous adhesive. Placing RPM's normally requires a crew of 5 people. Equipment may include a pickup truck, air compressor, and 2 or more trucks with a mounted attenuator.

6A3 - Pavement Marking Maintenance

There are a variety of markings on the highway to advise and direct motorists. Crosswalks, stop bars, directional arrows, HOV diamond, and railroad crossings are just a few. The combination of traffic, sand, dirt, and debris can wear these markings away over time and they must routinely be replaced. Many markings are painted on the roadway, but thermoplastic or methyl methacrylate materials are also used. Pavement marking replacement normally requires a crew of six people. Equipment may include a paint truck, flat bed truck, van, and changeable message sign mounted on a truck or trailer, and one or more truck mounted attenuators or buffers.

6A4 & 5 - Regulatory/Warning & Guide Sign Maintenance

There are a variety of signs placed on the highway to regulate, warn, guide, and inform motorists. Regulatory signs inform motorists of a law, regulation, or legal requirement such as stop signs, speed limit signs, or yield signs. Warning signs alert the motorist of a condition that may be hazardous on or adjacent to the roadway such as "Curve Ahead 35 MPH" or "Crossroad Ahead". Guide signs provide directional or navigational information to the motorists such as "Seattle Next Right" or distance to the next interchange or community. Informational signs provide motorists with information about facilities, services, and attractions such as "FOOD, GAS, LODGING" or which "Adopt-a-Highway" group is responsible for a given section of highway. These signs periodically get knocked down, are

damaged in some manner, eventually lose their reflective properties and readability due to fading from exposure to the elements, or just get dirty. Sign cleaning, repair, or replacement normally requires a crew of two people. Equipment may include a flat bed truck, bucket truck, or a boom truck with a post hole digger

6A6 - Guidepost Maintenance

Guideposts and delineators are placed along the edge of the highway to advise and guide motorists at intersections and on curves. These markers are a reflective indicator on a flexible post used to aid driving at night or during inclement weather such as snow, rain, or fog. Guideposts periodically get damaged in some manner, eventually lose their reflective properties due to fading from exposure to the elements, or just get dirty. Beginning in 2007, guidepost locations will be marked on the pavement, making it easier and faster to identify locations for replacement of missing guideposts. This will be instituted over time, with some marking done by contractors or inspectors on new pavement, some being done by maintenance crews as they go about their daily tasks. Cleaning, repair, or replacement normally requires a crew of two to four people. Equipment may include a flat bed truck, pickup truck with hand driver tools, bucket truck, air compressor, or a boom truck. A buffer truck may be necessary for traffic control safety.

6A7 - Guardrail Maintenance

Guardrail is placed at the edge of the pavement to prevent vehicles from striking hazardous obstacles, on coming traffic, or going down steep slopes. The purpose of the guardrail is to redirect errant vehicles and keep them on the road. Guardrail that is damaged must be repaired in order for it to maintain its functionality. Guardrail repair or replacement normally requires a crew of 3 to 10 people using a flat bed truck, backhoe, post hole digger, and a dump truck. A buffer truck may be necessary for traffic control safety.

6B1 - Traffic Signals

Traffic signals control the flow and direction of traffic at major intersections. This highly technical equipment must operate at all times to insure safe movement of vehicles through the intersection. Periodically bulbs burn out, or poles are damaged or knocked down, control units malfunction and electrical wiring or services short out or are lost due to power failure. This activity encompasses all traffic signal system repairs. Repair or replacement of signal fixtures requires technically skilled electricians, a truck, boom truck, bucket truck, and other specialized equipment. Operation of signals includes paying for electricity to power the traffic signals.

6B2 - Highway Lighting

Highway luminaires provide light at major intersections, interchange ramps, rest areas and along high volume highways to improve visibility and safety at night. Major signs are also lighted to improve visibility and readability. Periodically bulbs burn out, light poles are damaged or knocked down, or electrical wiring or services malfunction. This activity includes all repairs. Repair or replacement of lighting fixtures requires technically skilled electricians a truck, boom truck, bucket truck, and other specialized equipment. Operation of lighting includes paying for electricity to power the lights.

6B3 - Intelligent Transportation Systems (ITS)

Intelligent Transportation System equipment covers a broad variety of highly specialized equipment on the highway that is used to control and regulate the flow of traffic, and inform motorists. Examples of ITS for traffic control include ramp meters, reversible lane gates and signs, and variable speed limit signs. Informational equipment includes video cameras, highway advisory radio, and variable message signs. In some cases this equipment is part of a network that is operated through a central command center using telecommunications for operating and controlling the equipment. All such highly technical equipment requires routine maintenance and repairs in order to remain operational. This activity includes repairs only. Skilled electronics technicians use a variety of specialized equipment to maintain and operate the system. Crews range in size from 2 to 4 people depending on the complexity of the work. Operation of Intelligent Traffic Systems includes paying for electricity to power the systems.

6C1 - Traffic Signals Preventive Maintenance

This activity includes performing identified preventive maintenance tasks necessary to keep traffic signal systems operating at optimal performance and extend the longevity of the system. Technically skilled electricians are required to perform PM's. Essential equipment includes a truck, boom truck, bucket truck, and other specialized equipment.

6C2 - Highway Lighting Preventive Maintenance

This activity includes performing identified preventive maintenance tasks necessary to keep illumination systems operating at optimal performance and extend the longevity of the system. Technically skilled electricians are required to perform PM's. Essential equipment includes a truck, boom truck, bucket truck, and other specialized equipment.

6C3 - Intelligent Transportation Systems Preventive Maintenance

Preventive maintenance tasks, and the frequency for completion, have been identified for ITS equipment. This includes ramp meters, reversible lane gates and signs, variable message signs, closed circuit TV, highway advisory radio, and more. All such highly technical equipment requires preventive maintenance in order to remain at optimal performance. Skilled electronics technicians use a variety of specialized equipment to perform these tasks. Crews range in size from 2 to 4 people depending on the complexity of the work.

Group 7 – Rest Area Operations

7B1 – Rest Area Operations

There are 43 major rest areas in operation on the state highway system; 29 on interstate highways. The rest areas are small, park-like sites that offer a place for motorists to stop, use a rest room facility, rest, relax, obtain limited refreshments, and generally refresh themselves before continuing on their journey. All rest areas have rest rooms that must be cleaned and sanitized and litter receptacles emptied on a daily basis, and parking areas that must be cared for. Many rest areas have picnic tables, landscaping, and sidewalks to maintain. These sites also have water and sewer systems that must meet public health regulations for operation. Rest areas are usually cared for by one or more attendants who clean and sanitize the building and empty litter. At some locations, site work is done by separate crews on an as-needed basis. Two of the rest areas are maintained cooperatively by WSDOT and another entity.

Group 8 - Training and Testing

8B1 - Employee Technical & Safety Training

Training employees is critical to having a proficient and skilled work force. Much of the equipment that maintenance uses is very technical and requires periodic training to stay current. Many jobs require special licenses that can only be renewed through a continuing education program and obtaining a minimum number of training credits each year.

8B2 - Support and Testing

This activity covers a variety of miscellaneous things that are necessary in order for a maintenance organization to operate efficiently and effectively. Activities include field supervision, administrative/clerical support, organizing and inventorying stockpile sites, drug and alcohol testing, managing store rooms, and having a radio dispatcher.

Group 9 - 3rd Party Damages & Disaster Operations

9B1 - 3rd Party Damages

Whenever an errant vehicle damages part of the highway facility such as guardrail or a light pole, the driver is financially responsible for the repair or replacement. When a maintenance crew repairs such damage they charge their work to this activity so the cost of the repair can be accounted for and recovered.

9B2 - Disasters

Whenever a natural (or human-caused in some cases) disaster such as earthquake, flood, or fire damage restrict highway operation and the event is proclaimed a disaster by state or federal authorities, the cost for returning the facility to operation may be recoverable through disaster relief funding. This may also include the cost of personnel setting up temporary traffic control, detours, or road closures, and any other work related to operating the roadway during these disasters. When maintenance personnel are involved in any disaster-related work, they charge their work to this activity so the cost can be accounted for and recovered.

Work Operations

Work Operation Numbers (also called Work Operation Codes) are numbers used to track the cost of specific activities. These are entered on timesheets, stores orders, etc. along with a work order and group. Once these numbers are entered into the systems, reports can then be run showing how much a particular work order cost, how much was spent on a single work operation in a specified date range, how much was spent on a particular MAP activity and numerous other things. These pages contain information about work operations and their relationship to MAP activities.

Work operation code lists can be found in the Chart of Accounts at this web address: <http://wwwi.wsdot.wa.gov/FASC/Accounting/COApg.htm>. This list contains all the work operation codes for every Program and Sub Program associated with WSDOT.

Also on the web, at the Maintenance and Operations Home Page, <http://wwwi.wsdot.wa.gov/MaintOps/>, three work operation code lists that are specific to Maintenance, are available. The difference between these and what is found in the Chart of Accounts is the presence of a description of the work associated with the code. The first list (Long version) is used primarily in training, has many details and scenarios. Use this list if you are unfamiliar with how all of this functions together. The second list (Short version) contains descriptions, albeit not as detailed as the long version. The third list is simply a list of work operations.

The following pages contain a crosswalk showing which work operation codes are associated with which MAP activities. One MAP activity will have several work operation codes connected to it, but each work operation code is connected to only one MAP activity. For instance, MAP activity 1A1 has nine work operation codes. Each of these nine work operation codes is only associated with 1A1.

Operation Number Connection to MAP Activity

Unit

Group 1 Roadway Maintenance and Operations

1A1 Pavement Patching and Repair

1111	MECHANICAL PATCHING GRADER	TONS
1112	MECHANICAL PATCHING PAVER/BOX	TONS
1122	MANUAL PATCHING	SQ FT
1134	PAVEMENT MILLING/FULL DEPTH PATCHING	TONS
1147	CHIP SEAL PATCHING	100 GALS
1148	PATCHING - DURA PATCHER	GALLON
1161	CRACK & JOINT SEALING	LBS
1173	PATCHING WITH SUBGRADE REPAIR	SQ FT
1199	OTHER ROADWAY MAINTENANCE AS APPROVED BY SUPERINTENDENT	NONE

1A3 Shoulder Maintenance

1142	GRADE/RESHAPE SHOULDER	SHLDR MILE
1143	SHOULDER BUILDUP REMOVAL	CU YD
2414	CLEANING UNDER GUARDRAIL	LINEAR FT

1A4 Sweeping and Cleaning

1181	SWEEPING & CLEANING PAVEMENT - PICKUP BROOM	SHLDR MILE
1182	SWEEPING AND CLEANING RAISED ISLANDS - MANUAL	NONE
1183	SWEEPING & CLEANING PAVEMENT WITH SIDE CAST SWEEPER OR FLUSHER	SHLDR MILE
1184	SWEEPINGS RECYCLING	CU YD

1B1 Safety Patrol

1185	SECTION, SAFETY AND DEBRIS PATROL	EQUIP MILE
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Group 2 Drainage Maintenance and Slope Repair

2A1 Maintain Ditches

1311	DITCH MAINTENANCE	LINEAR FT
1329	CHANNEL MAINTENANCE	LINEAR FT
1399	OTHER DRAINAGE MAINTENANCE AS APPROVED BY SUPERINTENDENT	NONE

2A2 Maintain Culverts

1331	CULVERT CLEANING, MARKING, AND INSPECTION- MANUAL	EACH
1332	CULVERT CLEANING - MECHANICAL	EACH
1333	CULVERT REPAIR OR REPLACEMENT	EACH

2A3 Maintain Catch Basins and Inlets

1341	CATCH BASIN MARKING AND ROUTINE MAINTENANCE	EACH
1342	CATCH BASIN MECHANICAL CLEANING	EACH
1343	CATCH BASIN/MANHOLE REPAIR OR REPLACEMENT	EACH
1346	JERSEY BARRIER SCUPPER CLEANING	LINEAR FT
1352	VACTOR WASTE RECYCLING/DISPOSAL	CU YD

Operation Number Connection to MAP Activity

Unit

2A4 Maintain Detention/Retention Basins

1344	DETENTION/RETENTION BASIN MAINTENANCE	EACH
1345	UNDERGROUND RETENTION DETENTION FACILITY MAINTENANCE	EACH

2A5 Drainage Maintenance and Slope Repair

1211	SLOPE REPAIR SLIDE CLEAN UP & MAINTENANCE	CU YD
1212	SHOULDER WASHOUT REPAIR	CU YD
1213	RIP RAP AND CRIBBING REPAIR	CU YD
1214	SLIDE AND ROCK FALL DEBRIS DEBRIS CONTAINMENT: INSTALL OR REPAIR.	NONE
1299	OTHER SLOPE MAINTENANCE AS APPROVED BY SUPERINTENDENT	NONE

Group 3 Roadside and Vegetation Management

3A1 Litter Pickup

1671	ROAD KILL/ANIMAL DISPOSAL	EACH
1673	LITTER PICK-UP	CU YD
1674	LITTER BAG PICK-UP	CU YD
1675	ADOPT-A-HIGHWAY ADMINISTRATION	NONE

3A2 Noxious Weed Control

1616	NOXIOUS WEED CONTROL – SPOT SPRAY NON-POWER EQUIPMENT	NONE
1617	NOXIOUS WEED CONTROL – SPRAY WITH POWER EQUIPMENT	ACRE
1618	NOXIOUS WEED CONTROL – MANUAL	NONE
1619	NOXIOUS WEED CONTROL – MECHANICAL	ACRE
1641	HYDRO SEEDING & MULCHING	ACRE
1651	FERTILIZING & LIMING	ACRE

3A3 Nuisance Vegetation Control

1611	NUISANCE VEG. CONTROL - SPRAY WITH POWER EQUIPMENT	ACRE
1612	NUISANCE VEG. CONTROL - MECHANICAL	ACRE
1613	NUISANCE VEG. CONTROL - MANUAL	ACRE
1615	RESIDUAL HERBICIDE APPLICATION - ZONE 1	ACRE
1652	ROADSIDE MOWING	ACRE
1680	FENCE REPAIR & INSTALLATION	LINEAR FT
1683	PATH AND TRAIL REPAIR AND MAINTENANCE	NONE
1699	OTHER ROADSIDE MAINTENANCE AS APPROVED BY SUPERINTENDENT	NONE

3A4 Control of Vegetation Obstructions

1622	CONTROL OF VEG OBSTRUCTIONS - POWER SPRAYING	EACH
1625	CONTROL OF VEG OBSTRUCTIONS - MECHANICAL	EACH
1626	CONTROL OF VEG OBSTRUCTIONS - MANUAL	EACH
1628	DANGER TREE REMOVAL	EACH

Operation Number	Connection to MAP Activity	Unit
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3A5 Landscape Maintenance

1511	NUISANCE VEG. CONTROL - SPRAY WITH POWER EQUIPMENT	ACRE
1512	NUISANCE VEG. CONTROL - MECHANICAL	ACRE
1513	NUISANCE VEG. CONTROL - MANUAL	ACRE
1516	NOXIOUS WEED CONTROL – SPOT SPRAY NON-POWER EQUIPMENT	NONE
1517	NOXIOUS WEED CONTROL – SPRAY WITH POWER EQUIPMENT	ACRE
1518	NOXIOUS WEED CONTROL – MANUAL	ACRE
1519	NOXIOUS WEED CONTROL – MECHANICAL	ACRE
1525	CUTTING/PRUNING/SELECTIVE THIN	NONE
1541	SEEDING, MULCHING & PLANTING PLANT MATERIALS	NONE
1551	FERTILIZING & LIMING	ACRE
1552	MOWING ORNAMENTAL LAWNS	ACRE
1561	IRRIGATION SYSTEM OPERATION & MAINTENANCE	NONE
1599	OTHER LANDSCAPE MAINTENANCE AS APPROVED BY SUPERINTENDENT	NONE

Group 4 Bridge and Urban Tunnel Maintenance and Operations

4A1 Bridge Deck Repair

1936	DECK MAINTENANCE	SQ FT
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4A2 Structural Bridge Repair

1931	STRUCTURAL BRIDGE INSPECTION	NONE
1932	REMOVE DEBRIS UNDERNEATH BRIDGE	NONE
1941	NON-STRUCTURAL BRIDGE MAINTENANCE	NONE
1942	STRUCTURAL MAINTENANCE	NONE
1943	SCOUR REPAIR	NONE
1952	SIGN BRIDGE REPAIR, STRUCTURAL	EACH
1953	EXPANSION JOINT MAINTENANCE	LINEAR FT
1999	OTHER BRIDGE & STRUCTURES MAINTENANCE AS APPROVED BY SUPERINTENDENT	NONE

4A3 Bridge Cleaning

1922	BRIDGE, STRUCTURE CLEANING	NONE
1923	SURFACE/SIDEWALK CLEANING AND SWEEPING	NONE
1928	CLEAN AND REPAIR BRIDGE DRAIN	EACH
1933	PAINTING - INCLUDING SAND BLAST	NONE

Operation Number Connection to MAP Activity

Unit

4B1 Movable and Floating Bridge Operations

1915	PUMP WATER FROM PONTOON CELLS	NONE
1916	ANCHOR CABLE TENSIONING	NONE
1921	ROUTINE INSPECTION OF MOVABLE/FLOATING BRIDGES	NONE
1955	MOVABLE/FLOATING BRIDGE MECHANISM MAINTENANCE	NONE
1956	MOVABLE/FLOATING BRIDGE ELECTRICAL MAINTENANCE	NONE
1957	MOVABLE/FLOATING BRIDGE HYDRAULIC MAINTENANCE	NONE
1980	MOVABLE BRIDGE OPERATION	NONE

4B2 Keller Ferry Operations

2880	FERRY OPERATION	TRIP
2881	FERRY REPAIR & MAINTENANCE	NONE
2882	FERRY FACILITY REPAIR & MAINT	NONE
2899	OTHER FERRIES OPERATIONS AS APPROVED BY SUPERINTENDENT	NONE

4B3 Urban Tunnel Systems

3211	VENT FAN/MECHANICAL SYSTEM P M	EACH
3212	FIRE PROTECTION SYSTEMS - ELECTRONICS PM	EACH
3213	ELECTRICAL SYSTEM P.M.	EACH
3214	AIR PLENUM P.M.	NONE
3215	CARBON MONOXIDE MONITOR P.M.	EACH
3216	FIRE PROTECTION SYSTEMS - MECHANICAL PM	EACH
3217	COMPUTER OR ELECTRONICS SYSTEM PM	NONE
3231	VENT FAN/MECHANICAL SYSTEM REPAIR	EACH
3232	FIRE PROTECTION SYSTEMS - ELECTRONICS REPAIR	EACH
3233	ELECTRICAL SYSTEM REPAIR	EACH
3234	AIR PLENUM REPAIR	NONE
3235	CARBON MONOXIDE MONITOR REPAIR	EACH
3236	TUNNEL WASHING-WALLS	100 LINEAR FT
3237	TUNNEL WASHING-ILLUMINATION	NONE
3238	FIRE PROTECTION SYSTEMS - MECHANICAL REPAIR	EACH
3280	URBAN TUNNEL FACILITIES WORK	NONE
3291	COMPUTER OR ELECTRONICS SYSTEM WORK	NONE
3299	OTHER URBAN TUNNEL MAINTENANCE AS APPROVED BY SUPERINTENDENT	NONE

Operation Number Connection to MAP Activity

Unit

Group 5 Snow and Ice Control Operations

5B1 Snow and Ice Control Operations

2111	SNOW BLOWER	EQUIP MILE
2113	SNOW PLOWING TRUCK	EQUIP MILE
2115	SNOW PLOWING - MOTOR GRADER	EQUIP MILE
2117	SNOW DRIFT REMOVAL	NONE
2118	OPENING SEASONAL PASSES	NONE
2142	WINTER SAND CLEANUP	SHLDR MILE
2151	SANDING	NONE
2152	ANTI-ICING & DE-ICING APPLICATION-LIQUID	NONE
2153	ANTI-ICING & DE-ICING APPLICATION – SOLID	NONE
2161	MAINT GUIDE STAKES/POSTS/SIGNS	EACH
2162	WINTER DRAINAGE MAINTENANCE	NONE
2164	WINTER SAFETY PATROL	EQUIP MILE
2165	AVALANCHE CONTROL	NONE
2166	STOCKPILING & MIXING SAND & CHEMICALS, RELOCATING & RESHAPING STOCKPILES	NONE
2167	RADIO OPERATION	NONE
2168	DORMITORY & DINING ROOM OPERATIONS	NONE
2169	MIXING ANIT-ICING AND DE-ICING LIQUIDS	NONE
2181	WINTER FIELD SUPERVISION	NONE
2199	OTHER SNOW & ICE MAINTENANCE WORK AS APPROVED BY SUPERINTENDENT	NONE

Group 6 Traffic Control Maintenance and Operations

6A1 Pavement Striping Maintenance

2311	STRIPING - PAINT	LINE MILE
2312	STRIPING– DURABLE	LINEAR FT

6A2 Raised/Recessed Pavement Marker Maintenance

2315	REMOVE LANE MARKERS	EACH
2316	INSTALL LANE MARKERS	EACH

6A3 Pavement Marking Maintenance

2318	SPECIAL MARKINGS - PAINT	LINEAR FT
2323	PAVEMENT MARKINGS - PAINT	EACH
2326	PAVEMENT MARKINGS – DURABLE	EACH
2399	OTHER PAVEMENT MARKING MAINTENANCE AS APPROVED BY SUPERINTENDENT	NONE

6A4 Regulatory Sign Maintenance

2216	REGULATORY/WARNING SIGN, REPAIR, REPLACE & MAINTAIN	EACH
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Operation Number Connection to MAP Activity

Unit

6A5 Guide Sign Maintenance

2217	GUIDE SIGN, REPAIR, REPLACE & MAINT (SINGLE POST)	EACH
2218	GUIDE SIGN, REPAIR, REPLACE & MAINT (MULTIPLE POST)	EACH
2219	SIGN WASHING	EACH
2224	SIGN REPAIR/OVERHEAD SIGN BRIDGE	EACH
2299	OTHER SIGN MAINTENANCE AS APPROVED BY SUPERINTENDENT	NONE

6A6 Guidepost Maintenance

2241	GUIDEPOST & DELINEATOR MAINTENANCE	EACH
2242	GUIDEPOST & DELINEATOR REPLACEMENT	EACH

6A7 Guardrail Maintenance

2411	MAINT & REPAIR OF GUARDRAIL	LINEAR FT
2412	CONCRETE BARRIER MAINT AND REPAIR	LINEAR FT
2413	ATTENUATORS - MAINT, CLEANING AND REPAIR	EACH
2415	GUARDRAIL END TREATMENT	EACH
2499	OTHER GUARDRAIL MAINTENANCE AS APPROVED BY SUPERINTENDENT	NONE

6B1 Traffic Signal Systems

2611	SIGNAL CONTROL SYSTEM MAJOR PM	EACH
2612	SIGNAL CONTROL SYSTEM MINOR PM	EACH
2613	SIGNAL DISPLAY/ DETECT SYSTEM PM	EACH
2614	SIGNAL DISPLAY/ DETECT SYSTEM REPAIR	EACH
2632	SIGNAL CONTROL SYSTEM REPAIR	EACH
2645	COMMUNICATIONS REPAIR	EACH
2650	COMMISSIONING/TESTING	NONE
2651	SYSTEM ENHANCEMENT/DESIGN	NONE
2698	LOCATES FOR SIGNALS	EACH
2699	OTHER SIGNAL CONTROL MAINTENANCE AS APPROVED BY SUPERINTENDENT	NONE

6B2 Highway Lighting Systems

2711	ILLUMINATION SYSTEM P.M.	EACH
2715	ELECTRICAL SERVICE P.M.	EACH
2731	ILLUMINATION SYSTEM REPAIR	EACH
2737	ELECTRICAL SERVICES REPAIR	EACH
2750	COMMISSIONING/TESTING	NONE
2751	SYSTEM ENHANCEMENT/DESIGN	NONE
2798	LOCATES FOR LIGHTING	EACH
2799	OTHER ILLUMINATION MAINTENANCE AS APPROVED BY SUPERINTENDENT	NONE

Operation Number Connection to MAP Activity

Unit

6B3 Intelligent Traffic Systems

2512	RAMP METER SYSTEM P.M.	EACH
2513	CLOSED CIRCUIT TELEVISION P.M.	EACH
2514	VMS/CHANGEABLE SIGN P.M.	EACH
2515	HIGHWAY ADVISORY RADIO TRANSMITTER AND SIGN P.M.	EACH
2516	EXPRESS LANE GATES/SIGNS & BARRIER P.M.	EACH
2517	ROADWAY WEATHER INFORMATION STATION P.M.	EACH
2518	DATA STATION SYSTEMS P.M.	EACH
2519	HUB P.M.	EACH
2520	WEIGH STATIONS - WEIGH IN MOTION AND SIGN CONTROL SYSTEMS P.M.	EACH
2521	EMERGENCY PHONE PM	EACH
2522	RADIO REBROADCAST SYSTEM PM	EACH
2523	NWR HUB P.M.	EACH
2532	RAMP METER SYSTEM REPAIR	EACH
2533	CLOSED CIRCUIT TELEVISION REPAIR	EACH
2534	VARIABLE MESSAGE SIGN/CHANGEABLE MESSAGE SIGN REPAIR	EACH
2535	HIGHWAY ADVISORY RADIO TRANSMITTER AND SIGN REPAIR	EACH
2536	EXPRESS LANE GATES/SIGNS & BARRIER REPAIR	EACH
2537	ROADWAY WEATHER INFORMATION STATION REPAIR	EACH
2538	DATA STATION SYSTEM REPAIR	EACH
2539	HUB REPAIR	EACH
2540	WEIGH STATIONS - WEIGH IN MOTION AND SIGN CONTROL SYSTEMS REPAIR	EACH
2541	EMERGENCY PHONE REPAIR	EACH
2542	RADIO REBROADCAST SYSTEM REPAIR	EACH
2543	NWR HUB REPAIR	EACH
2544	COMMUNICATIONS REPAIR	EACH
2550	COMMISSIONING/TESTING	NONE
2551	SYSTEM ENHANCEMENT/DESIGN	NONE
2598	LOCATES FOR ITS	EACH
2599	OTHER ITS MAINTENANCE AS APPROVED BY SUPERINTENDENT	NONE

6B4 Permits

1431	VEHICLE PERMITS	NONE
1432	FRANCHISE PERMITS	NONE
1433	APPROACH PERMITS	NONE
1445	ILLEGAL SIGNS, ENCROACHMENT	NONE

Operation Number Connection to MAP Activity

Unit

Group 7 Rest Area Maintenance and Operations

7B1 Rest Area Operations

1711	WEED CONTROL MANUAL	NONE
1721	WINTER MAINTENANCE ACTIVITIES	NONE
1725	CUTTING/PRUNING/SELECTIVE THINNING	NONE
1741	SEEDING/PLANTING, MULCHING & FERTILIZING	NONE
1752	MOWING LAWNS	ACRE
1761	IRRIGATION SYSTEM OPERATION & MAINTENANCE	NONE
1773	LITTER PICK-UP	NONE
1774	GARBAGE COLLECTION AND DISPOSAL	CU YD
1781	GENERAL BUILDING MAINTENANCE	NONE
1782	JANITORIAL SERVICE	NONE
1783	ELECTRICAL MAINTENANCE	NONE
1784	DOMESTIC WATER SYSTEM MAINTENANCE	NONE
1787	SEWAGE SYSTEM MAINTENANCE	NONE
1788	RV DUMP MAINTENANCE	NONE
1799	OTHER REST AREA MAINTENANCE AS APPROVED BY SUPERINTENDENT	NONE

Group 8 Training and Testing

8B1 Employee Technical and Safety Training

6017	NON-REQUIRED TRAINING	NONE
6018	REQUIRED TRAINING	NONE
6019	SAFETY AND OTHER MEETINGS	NONE
6020	EQUIPMENT TRAINING	NONE
6032	INSTRUCTOR TRAINING	NONE

8B2 Support and Testing

0A28	LOCAL 17 SHOP STEWARD	NONE
0B28	FEDERATION SHOP STEWARD	NONE
0C28	LOCAL 17 CONTRACT NEGOTIATIONS	NONE
6014	MAINT OF STOCKPILE SITES	NONE
6015	YARD AND SHOP CLEAN UP	NONE
6016	FIELD SUPERVISION/EXCEPT SNOW&ICE	NONE
6024	RADIO OPERATOR - EXCL. SNOW/ICE	NONE
6027	ADMINISTRATIVE SUPPORT	NONE
6028	TORT LIABILITIES	NONE
6033	DRUG AND ALCOHOL TESTING	NONE
6099	OTHER TRAINING & GENERAL WORK AS APPROVED BY SUPERINTENDENT	NONE

Operation Number Connection to MAP Activity

Unit

Group 9 3rd Party Damage Repairs and Disaster Maintenance

9B1 3rd Party Damages

3111	PAVEMENT REPAIR	SQ FT
3112	ROADSIDE REPAIR	NONE
3113	FENCE REPAIR	LINEAR FT
3115	STRUCTURES	NONE
3120	HAZ WASTE/SPILL/DEBRIS CLEANUP	NONE
3122	GRAFFITI REMOVAL	SQ FT
3131	TRAFFIC SIGNS/DIRECTION MARKER	EACH
3150	CABLE GUARDRAIL	LINEAR FT
3151	BEAM GUARDRAIL	LINEAR FT
3152	ENERGY ABSORBING BARRIERS	EACH
3153	CONCRETE BARRIERS	LINEAR FT
3154	GUARDRAIL END TREATMENT	EACH
3161	TRAFFIC SIGNAL EQUIPMENT REPAIR	EACH
3162	EXPRESS LANE EQUIP. REPAIR	EACH
3163	VMS REPAIR	EACH
3164	HIGHWAY ADVISORY RADIO HAR REPAIR	EACH
3165	RWIS REPAIR	EACH
3166	DATA STATION REPAIR	EACH
3167	RAMP METER REPAIR	EACH
3168	CCTV REPAIR	EACH
3169	HUB REPAIR	EACH
3170	WEIGH IN MOTION REPAIR	EACH
3171	HIGHWAY LIGHTING SYSTEM REPAIR	EACH
3172	EMERGENCY PHONE REPAIR	EACH
3181	REST AREA REPAIR	NONE
3195	TRAFFIC CONTROL/DETOURS	NONE
3199	OTHER 3RD PARTY DAMAGE AS APPROVED BY SUPERINTENDENT	NONE

9B2 Disasters

4011	ROADWAY SURFACES	NONE
4013	DRAINAGE FACILITIES	NONE
4015	ROADSIDE & REST AREAS	NONE
4019	STRUCTURES	NONE
4021	BRIDGE INSPECTION	NONE
4022	TRAFFIC SERVICES	NONE
4095	TRAFFIC CONTROL/DETOURS	NONE
4099	OTHER DISASTER MAINTENANCE AS APPROVED BY SUPERINTENDENT	NONE

Chapter 4

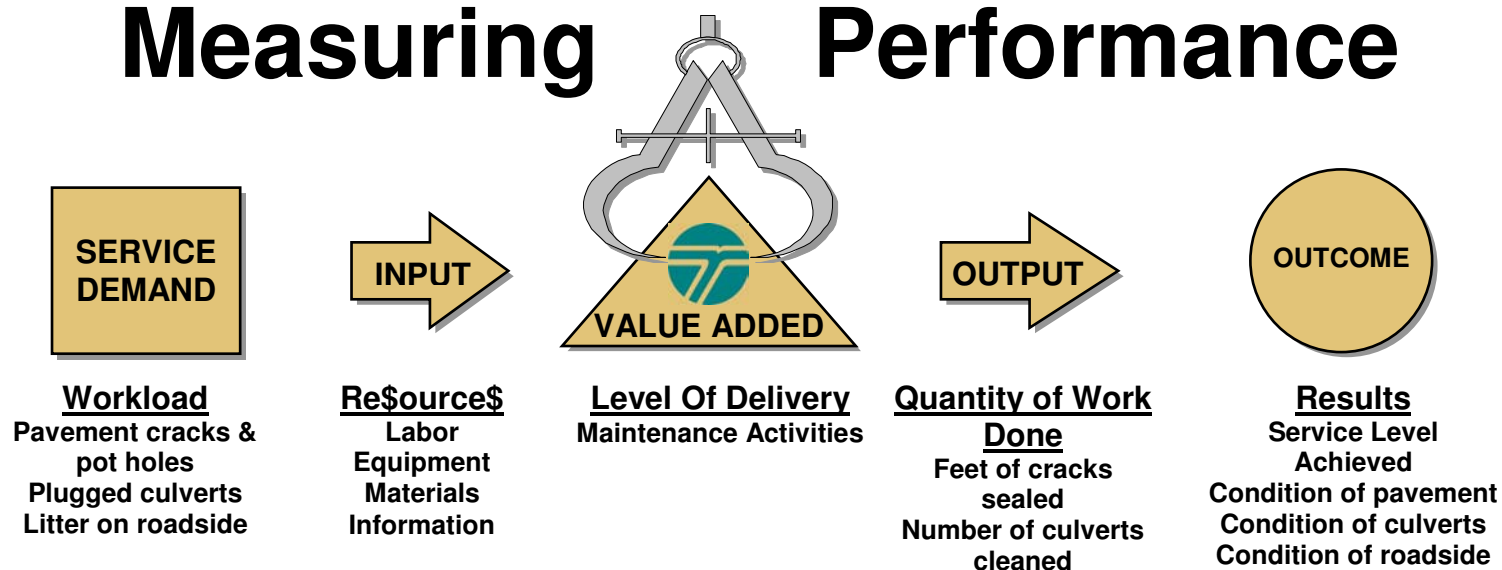
Performance Measures

The Maintenance Accountability Process utilizes outcome based performance measures with a rating scale of A (best) to F (worst) for reporting the level of service provided. Outcome based refers to the results of tasks accomplished by Maintenance personnel.

A performance measure is made up of a condition indicator, (deficiency or condition to be measured), outcome measure, (unit of measure), and thresholds for the five service levels for each MAP activity. A threshold is the range of allowable deficiencies or conditions for each service level.

The following pages define each of the performance measures. Included with each performance measure is information on timing (when the information is gathered and reported), what level the reporting is at (region, area, section), plus clarifying comments and the source of the data.

Measuring Performance



Performance Measures:



MAP Measures Outcomes

Outcomes - Measure the result (outcome)

- Examples:
- Service level rating
 - Sq. ft. of deficient pavement per lane
 - Per cent of culverts plugged
 - Amount of litter per system mile of highway

Outputs - Measure the quantity of work done.

- Examples:
- System miles maintained
 - Feet of crack sealed
 - Number of culverts cleaned
 - Cubic Yards of litter picked up

Group 1 - Roadway Maintenance and Operations

Activity Number:	1A1	Priority Rank:	12																
Activity Name:	Pavement Patching, Repair & Crack Sealing																		
Survey Period:	Summer	Detail Level:	Area/Section																
Indicator:	Pavement deficiencies.																		
Outcome Measure:	Linear feet of pavement deficiencies																		
Outcome Unit:	LF/LM																		
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0 - 500</td> <td>500.01 - 1000</td> <td>1000.01 - 2500</td> <td>2500.01 - 5000</td> <td>>5000</td> </tr> </tbody> </table>				Service Level					A	B	C	D	F	0 - 500	500.01 - 1000	1000.01 - 2500	2500.01 - 5000	>5000
Service Level																			
A	B	C	D	F															
0 - 500	500.01 - 1000	1000.01 - 2500	2500.01 - 5000	>5000															
Comments:	Rolls up potholes, alligator cracking, longitudinal and transverse cracking, humps and sags, and rutting. Activities 1A1 and 1A2 (crack sealing) combined into one activity in 2006, due to change in data collection.																		
Data Source:	Data collected from WSPMS.																		

Activity Number:	1A3	Priority Rank:	28																
Activity Name:	Shoulder Maintenance																		
Survey Period:	Summer	Detail Level:	Area/Section																
Indicator:	Paved shoulder with deficiencies.																		
Outcome Measure:	Percent of paved shoulder area with deficiencies.																		
Outcome Unit:	% SF																		
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0 - 2%</td> <td>2.1% - 4%</td> <td>4.1% - 8%</td> <td>8.1% - 15%</td> <td>> 15%</td> </tr> </tbody> </table>				Service Level					A	B	C	D	F	0 - 2%	2.1% - 4%	4.1% - 8%	8.1% - 15%	> 15%
Service Level																			
A	B	C	D	F															
0 - 2%	2.1% - 4%	4.1% - 8%	8.1% - 15%	> 15%															
Comments:	Rolls up shoulder potholes, alligator cracking, longitudinal and transverse cracking, humps and sags, edge ravelling, edge build-up and edge drop-off.																		
Data Source:	Data collected from field surveys.																		

Activity Number:	1A4	Priority Rank:	19																
Activity Name:	Sweeping and Cleaning																		
Survey Period:	Summer	Detail Level:	Area/Section																
Indicator:	Sand, rocks, and debris on paved shoulder.																		
Outcome Measure:	Percent of paved shoulder area with debris.																		
Outcome Unit:	% SF																		
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0 - 5%</td> <td>5.1% - 10%</td> <td>10.1% - 20%</td> <td>20.1% - 40%</td> <td>> 40%</td> </tr> </tbody> </table>				Service Level					A	B	C	D	F	0 - 5%	5.1% - 10%	10.1% - 20%	20.1% - 40%	> 40%
Service Level																			
A	B	C	D	F															
0 - 5%	5.1% - 10%	10.1% - 20%	20.1% - 40%	> 40%															
Comments:																			
Data Source:	Data collected from field surveys																		

Maintenance Accountability Process
Performance Measures

Group 1 - Roadway Maintenance and Operations

Activity Number:	1B1	Priority Rank:	23	
Activity Name:	Safety Patrol			
Survey Period:	Fall	Detail Level:	Area/Section	
Indicator:	Hours of Safety Patrol.			
Outcome Measure:	Hours of safety patrol per centerline mile to operate a safe highway.			
Outcome Unit:	Hrs/CLM			
Outcome Thresholds:	Service Level			
	A	B	C	D
	> 20	19.9 - 10	9.9 - 5	4.9 - 2
	< 2			
Comments:	Reporting period = Oct 1 through Sept 30 (last quarter of year and first three quarters of the following year),			
Data Source:	FIRS report, hours per region reported to work operation code 1185. Highway miles come from the State Highway Log. Query period is Oct 1 through Sept 30.			

Group 2 - Drainage Maintenance and Slope Repair

Activity Number:	2A1	Priority Rank:	20															
Activity Name:	Maintain Ditches																	
Survey Period:	Summer	Detail Level:	Area/Section															
Indicator:	Ditches with sediment build-up, unable to carry design flow.																	
Outcome Measure:	Percent of ditches greater than 50% filled with sediment/debris.																	
Outcome Unit:	% Full																	
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0 - 1%</td> <td>1.1% - 5%</td> <td>5.1% - 10%</td> <td>10.1% - 15%</td> <td>>15%</td> </tr> </tbody> </table>			Service Level					A	B	C	D	F	0 - 1%	1.1% - 5%	5.1% - 10%	10.1% - 15%	>15%
Service Level																		
A	B	C	D	F														
0 - 1%	1.1% - 5%	5.1% - 10%	10.1% - 15%	>15%														
Comments:																		
Data Source:	Data collected from field surveys.																	

Activity Number:	2A2	Priority Rank:	24															
Activity Name:	Maintain Culverts																	
Survey Period:	Summer	Detail Level:	Area/Section															
Indicator:	Cross culvert pipes plugged with dirt and/or debris, unable to carry design flow.																	
Outcome Measure:	Percent of pipes/culverts greater than 50% filled, or otherwise deficient.																	
Outcome Unit:	% Full																	
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0 - 2%</td> <td>2.1% - 5%</td> <td>5.1% - 10%</td> <td>10.1% - 20%</td> <td>>20%</td> </tr> </tbody> </table>			Service Level					A	B	C	D	F	0 - 2%	2.1% - 5%	5.1% - 10%	10.1% - 20%	>20%
Service Level																		
A	B	C	D	F														
0 - 2%	2.1% - 5%	5.1% - 10%	10.1% - 20%	>20%														
Comments:																		
Data Source:	Data collected from field surveys.																	

Activity Number:	2A3	Priority Rank:	11															
Activity Name:	Maintain Catch Basins and Inlets																	
Survey Period:	Summer	Detail Level:	Area/Section															
Indicator:	Catch basins and inlets that are blocked or have sediment build-up.																	
Outcome Measure:	Percent of inlets blocked or catch basins with silt build-up greater than 50%.																	
Outcome Unit:	% Full																	
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0 to 3%</td> <td>3.1% - 7%</td> <td>7.1% - 15%</td> <td>15.1% - 30%</td> <td>>30%</td> </tr> </tbody> </table>			Service Level					A	B	C	D	F	0 to 3%	3.1% - 7%	7.1% - 15%	15.1% - 30%	>30%
Service Level																		
A	B	C	D	F														
0 to 3%	3.1% - 7%	7.1% - 15%	15.1% - 30%	>30%														
Comments:																		
Data Source:	Data collected from field surveys.																	

Group 2 - Drainage Maintenance and Slope Repair

Activity Number:	2A4	Priority Rank:	30															
Activity Name:	Maintain Detention/Retention Basins																	
Survey Period:	Spring	Detail Level:	Statewide															
Indicator:	Silt Basins unable to hold design capacity.																	
Outcome Measure:	Percent of silt basins greater than 25% filled with sediment.																	
Outcome Unit:	% Def.																	
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0 - 1%</td> <td>1.1% - 5%</td> <td>5.1% - 10%</td> <td>10.1% - 15%</td> <td>>15%</td> </tr> </tbody> </table>			Service Level					A	B	C	D	F	0 - 1%	1.1% - 5%	5.1% - 10%	10.1% - 15%	>15%
Service Level																		
A	B	C	D	F														
0 - 1%	1.1% - 5%	5.1% - 10%	10.1% - 15%	>15%														
Comments:	Estimated service level. Performance measure development is in progress, in conjunction with NPDES permit.																	
Data Source:	Estimated service level.																	

Activity Number:	2A5	Priority Rank:	9															
Activity Name:	Slope Repair																	
Survey Period:	Summer	Detail Level:	Area/Section															
Indicator:	Unrepaired erosion or slides encroaching on, or undermining the shoulder or traveled lane.																	
Outcome Measure:	Percent of centerline miles with slides or erosion encroaching on, or undermining the shoulder or traveled way.																	
Outcome Unit:	% CLM																	
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0 - 2%</td> <td>2.1% - 4%</td> <td>4.1% - 7%</td> <td>7.1% - 10%</td> <td>>10%</td> </tr> </tbody> </table>			Service Level					A	B	C	D	F	0 - 2%	2.1% - 4%	4.1% - 7%	7.1% - 10%	>10%
Service Level																		
A	B	C	D	F														
0 - 2%	2.1% - 4%	4.1% - 7%	7.1% - 10%	>10%														
Comments:	Presence of one or more slope failures (Spring 01), reported as a 1 (yes, slope failures are present) or 0 (no slope failures exist).																	
Data Source:	Data collected from field surveys.																	

Group 3 - Roadside and Vegetation Management

Activity Number:	3A1	Priority Rank:	34															
Activity Name:	Litter Pickup																	
Survey Period:	Summer	Detail Level:	Area/Section															
Indicator:	Presence of litter on the roadside.																	
Outcome Measure:	Number of fist sized or larger objects present per centerline mile.																	
Outcome Unit:	EA/CLM																	
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0 - 125</td> <td>126 - 250</td> <td>251 - 500</td> <td>501 - 1000</td> <td>>1000</td> </tr> </tbody> </table>			Service Level					A	B	C	D	F	0 - 125	126 - 250	251 - 500	501 - 1000	>1000
Service Level																		
A	B	C	D	F														
0 - 125	126 - 250	251 - 500	501 - 1000	>1000														
Comments:																		
Data Source:	Data collected from field surveys.																	

Activity Number:	3A2	Priority Rank:	27															
Activity Name:	Noxious Weed Control																	
Survey Period:	Summer	Detail Level:	Area/Section															
Indicator:	Presence of noxious weeds on the roadside.																	
Outcome Measure:	Percent of roadside area with legally designated noxious weeds present.																	
Outcome Unit:	% Roadside																	
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0 - 1%</td> <td>1.1% - 2.5%</td> <td>2.6% - 5%</td> <td>5.1% - 15%</td> <td>>15%</td> </tr> </tbody> </table>			Service Level					A	B	C	D	F	0 - 1%	1.1% - 2.5%	2.6% - 5%	5.1% - 15%	>15%
Service Level																		
A	B	C	D	F														
0 - 1%	1.1% - 2.5%	2.6% - 5%	5.1% - 15%	>15%														
Comments:	This data is to be collected by persons qualified to identify noxious weeds. Current noxious weed lists can be found at www.nwcb.wa.gov/links.htm .																	
Data Source:	Data collected from field surveys.																	

Activity Number:	3A3	Priority Rank:	32															
Activity Name:	Nuisance Vegetation Control																	
Survey Period:	Summer	Detail Level:	Area/Section															
Indicator:	Presence of nuisance vegetation on the roadside, in a normally maintained area.																	
Outcome Measure:	Percent of normally maintained roadside area with nuisance vegetation present.																	
Outcome Unit:	% Roadside																	
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0 - 2.5%</td> <td>2.6% - 5%</td> <td>5.1% - 10%</td> <td>10.1% - 20%</td> <td>>20%</td> </tr> </tbody> </table>			Service Level					A	B	C	D	F	0 - 2.5%	2.6% - 5%	5.1% - 10%	10.1% - 20%	>20%
Service Level																		
A	B	C	D	F														
0 - 2.5%	2.6% - 5%	5.1% - 10%	10.1% - 20%	>20%														
Comments:	This data is to be collected by persons qualified to identify nuisance weeds.																	
Data Source:	Data collected from field surveys.																	

Group 3 - Roadside and Vegetation Management

Activity Number:	3A4	Priority Rank:	17																	
Activity Name:	Control of Vegetation Obstructions																			
Survey Period:	Summer	Detail Level:	Area/Section																	
Indicator:	Presence of vegetation blocking site lines to intersections or signs.																			
Outcome Measure:	Percent of centerline miles with instances of vegetation obstructions.																			
Outcome Unit:	% CLM																			
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0 - 0.5%</td> <td>0.6% - 1.5%</td> <td>1.6% - 3.5%</td> <td>3.6% - 6%</td> <td>>6%</td> </tr> </tbody> </table>					Service Level					A	B	C	D	F	0 - 0.5%	0.6% - 1.5%	1.6% - 3.5%	3.6% - 6%	>6%
Service Level																				
A	B	C	D	F																
0 - 0.5%	0.6% - 1.5%	1.6% - 3.5%	3.6% - 6%	>6%																
Comments:	Presence of one or more vegetation obstructions reported as a 1 (yes, veg obs are present) or 0 (no veg obs exist). Changed measure, thresholds, and calculations 8/2003. See tblActivitiesHistory for previous performance measure.																			
Data Source:	Data collected from field surveys.																			

Activity Number:	3A5	Priority Rank:	33																	
Activity Name:	Landscape Maintenance																			
Survey Period:	Summer	Detail Level:	Region																	
Indicator:	Appearance and health of landscaped roadside areas.																			
Outcome Measure:	Condition score. Sum of Weed Control, Plant Health, and Trimming/Pruning/Planting condition ratings. See MAP Landscape Survey Matrix.																			
Outcome Unit:	Score																			
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0 - 3</td> <td>4</td> <td>5 - 6</td> <td>7 - 8</td> <td>9</td> </tr> </tbody> </table>					Service Level					A	B	C	D	F	0 - 3	4	5 - 6	7 - 8	9
Service Level																				
A	B	C	D	F																
0 - 3	4	5 - 6	7 - 8	9																
Comments:	Surveys are conducted by Regions on all formal landscape areas in summer for fall reporting. Regions will update locations as needed, each year.																			
Data Source:	Data collected from landscape survey performed by Regions in late spring/early summer.																			

Maintenance Performance Measures

Group 3 - Roadside and Landscape Maintenance

3A5 - Landscape Maintenance Condition Description Matrix

	<i>Weed Control</i>	<i>Plant Health</i>	<i>Trimming, Pruning and Planting</i>
Condition 1	Planting beds with less than 5% visible weeds.	Plants healthy and lush. Less than 5% of the plants exhibit visible stress or disease. Ground cover has 100% coverage. Lawns contain less than 5% visible weeds and dry spots.	All plants exhibit appropriate shape and character. Lawns mowed and trimmed regularly, 5% voids in plant beds. Plants have not overgrown their location.
Condition 2	Planting beds with less than 15% visible weeds.	Less than 15% of plants exhibiting some stress or disease. Ground cover has no less than 90% coverage. Less than 15% of lawn area contains visible weeds or dry spots.	No more than 15% of all plants exhibit sprouting or contain a few dead or dying branches. Lawns mowed but not trimmed regularly. Less than 15% voids in plant beds. Plants have not overgrown their location.
Condition 3	Planting beds with greater than 15% visible weeds.	Greater than 15% of plants exhibiting some stress or disease. Ground cover has less than 90% coverage. Greater than 15% of lawn area contains visible weeds, dry spots, and are allowed to go dormant in the summer.	More than 15% of all plants may exhibit sprouting or contain dead or dying branches. Lawns mowed until dormant but not trimmed. Greater than 15% voids in plant beds. Greater than 15% of plants have overgrown their location.

Condition Total = Weed Control Condition + Plant Health Condition + Trimming, Pruning Planting Condition

<u>Service Level</u>	<u>Condition Total</u>
A	3
B	4
C	5 to 6
D	7 to 8
F	9

Group 4 - Bridge and Urban Tunnel Maintenance and Operations

Activity Number:	4A1	Priority Rank:	13																
Activity Name:	Bridge Deck Repair																		
Survey Period:	Fall	Detail Level:	Region																
Indicator:	Unrepaired deck spalling of 6" or greater on the bridge deck																		
Outcome Measure:	Percent of bridge deck with spalling.																		
Outcome Unit:	% Def.																		
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0 - 0.0025%</td> <td>0.0026 - 0.015%</td> <td>0.0151 - 0.05%</td> <td>0.051 - 0.15%</td> <td>0.151 - 0.3%</td> </tr> </tbody> </table>				Service Level					A	B	C	D	F	0 - 0.0025%	0.0026 - 0.015%	0.0151 - 0.05%	0.051 - 0.15%	0.151 - 0.3%
Service Level																			
A	B	C	D	F															
0 - 0.0025%	0.0026 - 0.015%	0.0151 - 0.05%	0.051 - 0.15%	0.151 - 0.3%															
Comments:	Modified 9/2003. Measure SF of spalling on the bridge deck. Total deck SF from the bridge inventory. Modified service level thresholds.																		
Data Source:	Data is collected from bridge inspection reports, through BPO.																		

Activity Number:	4A2	Priority Rank:	7																
Activity Name:	Structural Bridge Repair																		
Survey Period:	Fall	Detail Level:	Region																
Indicator:	Priority 1 deficiencies identified on bridges.																		
Outcome Measure:	Percent of Priority 1 repairs completed.																		
Outcome Unit:	% Completed																		
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>100% - 90%</td> <td>89% - 80%</td> <td>79% - 65%</td> <td>64% - 50%</td> <td><50%</td> </tr> </tbody> </table>				Service Level					A	B	C	D	F	100% - 90%	89% - 80%	79% - 65%	64% - 50%	<50%
Service Level																			
A	B	C	D	F															
100% - 90%	89% - 80%	79% - 65%	64% - 50%	<50%															
Comments:	Modified 9/2003. Review bridge repair list for applicable Priority 1 repairs completed. Regions will also document Priority 1 repairs completed before making it on to the repair list (emergent P1's).																		
Data Source:	Data gathered from regions, using bridge repair lists and regional emergent lists. Reporting time frame - repairs completed between July 1 through June 30 (fiscal year).																		

Group 4 - Bridge and Urban Tunnel Maintenance and Operations

Activity Number:	4A3	Priority Rank:	31																	
Activity Name:	Bridge Cleaning																			
Survey Period:	Fall	Detail Level:	Area/Section																	
Indicator:	Dirty bridge surfaces and sidewalks, blocked bridge drains, graffiti.																			
Outcome Measure:	Condition score. Sum of Deck/Sidewalks, Bridge Drains and Graffiti condition ratings. See MAP Bridge Survey Form and scoring matrix.																			
Outcome Unit:	Score																			
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0 - 4</td> <td>5 - 7</td> <td>8 - 10</td> <td>11 - 13</td> <td>14 - 16</td> </tr> </tbody> </table>					Service Level					A	B	C	D	F	0 - 4	5 - 7	8 - 10	11 - 13	14 - 16
Service Level																				
A	B	C	D	F																
0 - 4	5 - 7	8 - 10	11 - 13	14 - 16																
Comments:	Modified 12/2006. Added drain score back in. Did not modify service level thresholds.																			
Data Source:	Data is collected from bridge surveys, conducted by regional personnel.																			

Activity Number:	4B1	Priority Rank:	1																	
Activity Name:	Movable and Floating Bridge Operations																			
Survey Period:	Fall	Detail Level:	Region																	
Indicator:	Delayed opening/closing due to mechanical malfunction.																			
Outcome Measure:	Percent openings/closings delayed due to mechanical malfunction.																			
Outcome Unit:	% Delayed																			
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0 - 2%</td> <td>2.1% - 5%</td> <td>5.1% -10%</td> <td>10.1% 20%</td> <td>> 20%</td> </tr> </tbody> </table>					Service Level					A	B	C	D	F	0 - 2%	2.1% - 5%	5.1% -10%	10.1% 20%	> 20%
Service Level																				
A	B	C	D	F																
0 - 2%	2.1% - 5%	5.1% -10%	10.1% 20%	> 20%																
Comments:	Movable or Floating Bridges are only in NW, OL and SC regions.																			
Data Source:	Request data from the regions. Query period is Oct 1 through Sept 30.																			

Activity Number:	4B2	Priority Rank:	5																	
Activity Name:	Keller Ferry Operations																			
Survey Period:	Fall	Detail Level:	Region																	
Indicator:	Service availability.																			
Outcome Measure:	Hours/days of operation.																			
Outcome Unit:	Score																			
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>24 hrs/day 365 days/yr</td> <td>18 hrs/day 365 days/yr</td> <td>14 hrs/day 365 days/yr</td> <td>12 hrs/day 313 days/yr</td> <td>8 hrs/day 261 days/yr</td> </tr> </tbody> </table>					Service Level					A	B	C	D	F	24 hrs/day 365 days/yr	18 hrs/day 365 days/yr	14 hrs/day 365 days/yr	12 hrs/day 313 days/yr	8 hrs/day 261 days/yr
Service Level																				
A	B	C	D	F																
24 hrs/day 365 days/yr	18 hrs/day 365 days/yr	14 hrs/day 365 days/yr	12 hrs/day 313 days/yr	8 hrs/day 261 days/yr																
Comments:																				
Data Source:	Request data from Eastern region, Davenport Maintenance Office.																			

Group 4 - Bridge and Urban Tunnel Maintenance and Operations

Activity Number:	4B3	Priority Rank:	6															
Activity Name:	Urban Tunnel Systems Operations																	
Survey Period:	Fall	Detail Level:	Region															
Indicator:	Tunnel closure to flammable cargo for maintenance or malfunctioning mechanical, electrical, or hydraulic systems.																	
Outcome Measure:	Number of tunnel closures to flammable cargo per year.																	
Outcome Unit:	Closure/Year																	
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0 - 5</td> <td>6 -10</td> <td>11 - 25</td> <td>26 -50</td> <td>>50</td> </tr> </tbody> </table>			Service Level					A	B	C	D	F	0 - 5	6 -10	11 - 25	26 -50	>50
Service Level																		
A	B	C	D	F														
0 - 5	6 -10	11 - 25	26 -50	>50														
Comments:																		
Data Source:	Contact I-90 tunnel group for data. Reporting period is Oct 1 through Sept 30.																	

Activity Number:	4C1	Priority Rank:																
Activity Name:	Movable and Floating Bridge Preventive Maintenance																	
Survey Period:	Fall	Detail Level:	Region															
Indicator:	Preventive Maintenance tasks identified, per O&M Manual																	
Outcome Measure:	Percent of identified PM's completed																	
Outcome Unit:	% Completed																	
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>100% - 90%</td> <td>89% - 80%</td> <td>79% - 70%</td> <td>69% - 60%</td> <td>< 60%</td> </tr> </tbody> </table>			Service Level					A	B	C	D	F	100% - 90%	89% - 80%	79% - 70%	69% - 60%	< 60%
Service Level																		
A	B	C	D	F														
100% - 90%	89% - 80%	79% - 70%	69% - 60%	< 60%														
Comments:	Performance measure development is complete, but deployment of MPET is not. Reporting for this measure is on hold.																	
Data Source:	Data is contained in MPET. Work with regions to ensure all data is input prior to reporting. Reporting period is Oct 1 through Sept 30.																	

Group 4 - Bridge and Urban Tunnel Maintenance and Operations

Activity Number:	4C3	Priority Rank:																	
Activity Name:	Urban Tunnels Preventive Maintenance																		
Survey Period:	Fall	Detail Level:	Region																
Indicator:	Preventive Maintenance tasks identified, per manufacturer recommendation																		
Outcome Measure:	Percent of identified PM's completed																		
Outcome Unit:	% Completed																		
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>100% - 95%</td> <td>94% - 90%</td> <td>89% - 85%</td> <td>84% - 80%</td> <td><80%</td> </tr> </tbody> </table>				Service Level					A	B	C	D	F	100% - 95%	94% - 90%	89% - 85%	84% - 80%	<80%
Service Level																			
A	B	C	D	F															
100% - 95%	94% - 90%	89% - 85%	84% - 80%	<80%															
Comments:	Performance measure development is complete, but reporting for this measure is on hold. Reporting period is Oct 1 through Sept 30.																		
Data Source:	Data is contained in MPET. Work with NW region to ensure all data is input prior to reporting. Reporting																		

Group 4 - Bridge Maintenance

4A3 - Bridge Cleaning Condition Description Matrix

	<i>Decks and Sidewalks</i>	<i>Grates and Drains</i>	<i>Rails, Girders, Trusses, Piers Abutments</i>
Condition 1	Free of visible sand and debris.	Free of visible sand & debris.	Free of graffiti, moss, bird droppings, rust or other surface dirt.
Condition 2	Less than 10% of surface area covered with sand or debris.	Less than 5% blocked or partially blocked.	Less than 10% of bridge surface covered with graffiti, moss, bird droppings, rust or other surface dirt.
Condition 3	Less than 20% of surface area covered with sand or debris.	Less than 10% blocked or partially blocked.	Less than 30% of bridge surface covered with graffiti, moss, bird droppings, rust or other surface dirt.
Condition 4	Less than 40% of surface area covered with sand or debris.	Less than 20% blocked or partially blocked.	Less than 50% of bridge surface covered with graffiti, moss, bird droppings, rust or other surface dirt.
Condition 5	Greater than 40% of surface area covered with sand or debris.	More than 20% blocked or partially blocked	More than 50% of bridge surface covered with graffiti, moss, bird droppings, rust or other surface dirt.

Condition Total = Decks and Sidewalks + Graffiti

<u>Service Level</u>	<u>Condition Total</u>
A	3
B	4 to 5
C	6 to 7
D	8 to 9
F	10 or more

Maintenance Accountability Process
Performance Measures

Group 5 - Snow and Ice Control Operations

Activity Number:	5B1	Priority Rank:	4	
Activity Name:	Snow and Ice Control Operations			
Survey Period:	Spring	Detail Level:	Area/Section	
Indicator:	Snow and/or ice on the roadway reducing traction and safety.			
Outcome Measure:	Improved road conditions from application of sand or deicer to the highway surface when snow and/or ice is present.			
Outcome Unit:	Score			
Outcome Thresholds:	Service Level			
	A	B	C	D
	1 -2	2.1 - 3	3.1 - 4	4.1 - 5
				F
				> 5
Comments:	Data is collected from Snow & Ice Application records dated Nov 1 through March 31.			
Data Source:	Snow & Ice application record.			

Winter MAP Snow and Ice Data Collection:

Performance Measure: The performance of the Maintenance Program as Snow & Ice control activities are conducted is measured in terms of the results of these activities. The most important, overall result for snow and ice control is the condition of the travel lanes provided by maintenance actions (i.e. sanding or deicing) during winter conditions (i.e. snow, ice, frost).

Performance measure information is used to determine the Level of Service (LOS) provided by the maintenance program through out a given winter season. LOS ratings can be determined on different scales that range from statewide to route specific.

When: Road conditions are assessed after chemical or sand applications are made during the winter season. There are no specified days or times during which road conditions should be documented. This documentation should be made after sand or chemical application is completed and the intended result (i.e. bare pavement) has had a chance to materialize. Maintenance personnel should document road conditions as they drive over previously-treated roads in the course of their daily work as opposed to making a special trip to a roadway location solely to document road conditions.

Where: Roadway conditions that result from maintenance actions can be documented at any location where a treatment was applied.

How: Maintenance personnel conduct the condition assessments by observing the condition of a roadway (all lanes, both directions). Observations are documented on the winter maintenance Personalized Digital Assistant (PDA) application/database.

Ratings: Different road conditions are assigned different point values. The point values are used to calculate the LOS ratings. There are two classes of road conditions on the form that represent the two primary ways that WSDOT provides snow and ice control services. One is to enhance traction on top of snow/ice by spreading abrasives (i.e. sand) on the travel lane. The other is to attempt to provide a bare pavement surface by applying chemicals to the travel lane. Point values for different conditions are as follows with commensurate LOS ratings:

Road Condition Rating for Sand Treatment	Points	LOS Rating
100% of roadway has sand present	3	C+
50% or more of roadway has sand present	3.5	C
All emphasis areas have sand present	4	D+
50% or more of emphasis areas have sand present	5	F+
50% or less of emphasis areas have sand present	5.9	F
Unable to evaluate	-	-

Road Condition Rating for Chemical Treatment	Points	LOS Rating
Bare Pavement	1	A+
Patches of frost, black ice, slush, or compact.	1.5	A
Wheel tracks bare, frost, snow, or ice encountered.	2	B+
50% of roadway with compact snow and ice.	3	C+
Entire roadway covered with compact snow and ice.	4	D+
Unable to evaluate	-	-

Note: Emphasis Areas include hills, bridges, curves, intersections and known problem areas.

Group 6 - Traffic Control Maintenance and Operations

Activity Number:	6A1	Priority Rank:	15															
Activity Name:	Pavement Striping Maintenance																	
Survey Period:	Spring	Detail Level:	Region															
Indicator:	Lane or edge strip reflectivity, as measured with a retro reflectometer, once a year prior to restriping.																	
Outcome Measure:	Reflectivity Score.																	
Outcome Unit:	Score																	
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0 -201</td> <td>201.01-165</td> <td>165.01-80</td> <td>80.01-30</td> <td><30</td> </tr> </tbody> </table>			Service Level					A	B	C	D	F	0 -201	201.01-165	165.01-80	80.01-30	<30
Service Level																		
A	B	C	D	F														
0 -201	201.01-165	165.01-80	80.01-30	<30														
Comments:	Effective Fall 06, data collected using a retroreflectometer, prior to striping.																	
Data Source:	Data is collected by regional striping crews, submitted to HQ Traffic, then forwarded to M&O MAP personnel. THIS PERFORMANCE MEASURE IS IN REVIEW AND WILL BE CHANGED. AZ 3/2/08.																	

Activity Number:	6A2	Priority Rank:	16															
Activity Name:	Raised/Recessed Pavement Marker Maintenance																	
Survey Period:	Summer	Detail Level:	Region															
Indicator:	Missing or damaged pavement markers (buttons).																	
Outcome Measure:	Percent of pavement markers damaged or missing.																	
Outcome Unit:	% Def.																	
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0 - 5%</td> <td>5.1% - 10%</td> <td>10.1% - 20%</td> <td>20.1% - 30%</td> <td>> 30%</td> </tr> </tbody> </table>			Service Level					A	B	C	D	F	0 - 5%	5.1% - 10%	10.1% - 20%	20.1% - 30%	> 30%
Service Level																		
A	B	C	D	F														
0 - 5%	5.1% - 10%	10.1% - 20%	20.1% - 30%	> 30%														
Comments:																		
Data Source:	Data collected from field surveys.																	

Activity Number:	6A3	Priority Rank:	26															
Activity Name:	Pavement Marking Maintenance																	
Survey Period:	Summer	Detail Level:	Region															
Indicator:	Stop bars, arrows, crosswalks, etc., having more than 25% of marking worn or missing.																	
Outcome Measure:	Percent of pavement markings with more than 25% worn or missing.																	
Outcome Unit:	% Def.																	
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0 - 2%</td> <td>2.1% - 10%</td> <td>10.1% - 20%</td> <td>20.1% - 30%</td> <td>> 40%</td> </tr> </tbody> </table>			Service Level					A	B	C	D	F	0 - 2%	2.1% - 10%	10.1% - 20%	20.1% - 30%	> 40%
Service Level																		
A	B	C	D	F														
0 - 2%	2.1% - 10%	10.1% - 20%	20.1% - 30%	> 40%														
Comments:																		
Data Source:	Data collected from field surveys.																	

Group 6 - Traffic Control Maintenance and Operations

Activity Number:	6A4	Priority Rank:	8																	
Activity Name:	Regulatory Sign Maintenance																			
Survey Period:	Fall	Detail Level:	Region																	
Indicator:	Regulatory and Warning signs that are unreadable at night.																			
Outcome Measure:	Percent of regulatory/warning signs that are unreadable at night.																			
Outcome Unit:	% Def.																			
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0 - 1%</td> <td>1.1% - 2%</td> <td>2.1% - 5%</td> <td>5.1% - 10%</td> <td>> 10%</td> </tr> </tbody> </table>					Service Level					A	B	C	D	F	0 - 1%	1.1% - 2%	2.1% - 5%	5.1% - 10%	> 10%
Service Level																				
A	B	C	D	F																
0 - 1%	1.1% - 2%	2.1% - 5%	5.1% - 10%	> 10%																
Comments:	Effective 2005, regions must review half of signs each year, data is input into sign database. Request data from HQ Traffic.																			
Data Source:	Request data from HQ Traffic.																			

Activity Number:	6A5	Priority Rank:	29																	
Activity Name:	Guide Sign Maintenance																			
Survey Period:	Fall	Detail Level:	Region																	
Indicator:	Guide signs that are unreadable at night.																			
Outcome Measure:	Percent of guide signs that are unreadable at night.																			
Outcome Unit:	% Def.																			
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0 - 2%</td> <td>2.1% - 5%</td> <td>5.1% - 10%</td> <td>10.1% - 15%</td> <td>>15%</td> </tr> </tbody> </table>					Service Level					A	B	C	D	F	0 - 2%	2.1% - 5%	5.1% - 10%	10.1% - 15%	>15%
Service Level																				
A	B	C	D	F																
0 - 2%	2.1% - 5%	5.1% - 10%	10.1% - 15%	>15%																
Comments:	Effective 2005, regions must review half of signs each year, data is input into sign database. Request data from HQ Traffic.																			
Data Source:	Request data from HQ Traffic.																			

Group 6 - Traffic Control Maintenance and Operations

Activity Number:	6A6	Priority Rank:	22															
Activity Name:	Guidepost Maintenance																	
Survey Period:	Summer	Detail Level:	Area/Section															
Indicator:	Missing or broken guideposts.																	
Outcome Measure:	Percent of guideposts that are broken or missing.																	
Outcome Unit:	% Def.																	
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0 - 1%</td> <td>1.1% - 5%</td> <td>5.1% - 10%</td> <td>10.1% - 20%</td> <td>> 20%</td> </tr> </tbody> </table>			Service Level					A	B	C	D	F	0 - 1%	1.1% - 5%	5.1% - 10%	10.1% - 20%	> 20%
Service Level																		
A	B	C	D	F														
0 - 1%	1.1% - 5%	5.1% - 10%	10.1% - 20%	> 20%														
Comments:	Fall 2006, ME's agreed that guidepost locations will be marked, making it easier to locate for MAP, and identifying missing guideposts. The marking will be done by construction projects and maintenance personnel. The goal is to have all guidepost locations marked by the end of 2008.																	
Data Source:	Data collected from field surveys.																	

Activity Number:	6A7	Priority Rank:	14															
Activity Name:	Guardrail Maintenance																	
Survey Period:	Summer	Detail Level:	Area/Section															
Indicator:	Damaged or defective guardrail.																	
Outcome Measure:	Percent of guardrail that is damaged or missing.																	
Outcome Unit:	% Def.																	
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0 - 1%</td> <td>1.1% - 3%</td> <td>3.1% - 5%</td> <td>5.1% - 10%</td> <td>> 10%</td> </tr> </tbody> </table>			Service Level					A	B	C	D	F	0 - 1%	1.1% - 3%	3.1% - 5%	5.1% - 10%	> 10%
Service Level																		
A	B	C	D	F														
0 - 1%	1.1% - 3%	3.1% - 5%	5.1% - 10%	> 10%														
Comments:																		
Data Source:	Data collected from field surveys.																	

Group 6 - Traffic Control Maintenance and Operations

Activity Number:	6B1	Priority Rank:	3																	
Activity Name:	Traffic Signal Systems Operations																			
Survey Period:	Fall	Detail Level:	Region																	
Indicator:	Traffic signals at an intersection flashing, with burned out bulbs, or with a control system malfunction.																			
Outcome Measure:	Number of repairs per signal system required for this type of malfunction. Preventive maintenance is NOT counted.																			
Outcome Unit:	Rep./Sig./Yr																			
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>1 per 2 years</td> <td>1 per year</td> <td>2 per year</td> <td>3 per year</td> <td>4 per year</td> </tr> </tbody> </table>					Service Level					A	B	C	D	F	1 per 2 years	1 per year	2 per year	3 per year	4 per year
Service Level																				
A	B	C	D	F																
1 per 2 years	1 per year	2 per year	3 per year	4 per year																
Comments:	To be counted as a repair, malfunction must be reported. Needed repairs discovered during the completion of a PM are NOT counted as repairs, for MAP purposes.																			
Data Source:	Data is located in SIMMS and provided by region Traffic, using form sent to them by MAP personnel. Reporting period is Oct 1 through Sept 30.																			

Activity Number:	6B2	Priority Rank:	21																	
Activity Name:	Highway Lighting Systems Operations																			
Survey Period:	Fall	Detail Level:	Region																	
Indicator:	Burned out or cycling highway lights.																			
Outcome Measure:	Percent of highway lights malfunctioning.																			
Outcome Unit:	% Mlfctn																			
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>0 - 5 %</td> <td>5.1% - 7.5%</td> <td>7.6% - 10%</td> <td>10.1% -20%</td> <td>> 20%</td> </tr> </tbody> </table>					Service Level					A	B	C	D	F	0 - 5 %	5.1% - 7.5%	7.6% - 10%	10.1% -20%	> 20%
Service Level																				
A	B	C	D	F																
0 - 5 %	5.1% - 7.5%	7.6% - 10%	10.1% -20%	> 20%																
Comments:	Effective Fall 06 data is provided by regions.																			
Data Source:	Data provided by region Traffic, using form sent to them by MAP personnel.																			

Group 6 - Traffic Control Maintenance and Operations

Activity Number:	6B3	Priority Rank:	10																	
Activity Name:	Intelligent Transportation Systems Operations																			
Survey Period:	Fall	Detail Level:	Region																	
Indicator:	Malfunctioning ramp meters, reversible lane gates, signs, cameras, etc.																			
Outcome Measure:	Number of repairs per ITS component required for this type of malfunction. Preventive maintenance is NOT counted.																			
Outcome Unit:	Rep./ITS/Yr																			
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>1 per 2 years</td> <td>1 per year</td> <td>2 per year</td> <td>3 per year</td> <td>4 per year</td> </tr> </tbody> </table>					Service Level					A	B	C	D	F	1 per 2 years	1 per year	2 per year	3 per year	4 per year
Service Level																				
A	B	C	D	F																
1 per 2 years	1 per year	2 per year	3 per year	4 per year																
Comments:	Thresholds modified 12/2003. Data is located in SIMMS and provided by region Traffic, using form sent to them by MAP personnel. Reporting period is Oct 1 through Sept 30.																			
Data Source:	Data provided by region Traffic, using form sent to them by MAP personnel.																			

Activity Number:	6C1	Priority Rank:																		
Activity Name:	Traffic Signal Systems Preventive Maintenance																			
Survey Period:	Fall	Detail Level:	Region																	
Indicator:	Preventive Maintenance tasks identified.																			
Outcome Measure:	Percent of identified PM's completed																			
Outcome Unit:	% Completed																			
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>100% - 90%</td> <td>89% - 80%</td> <td>79% - 70%</td> <td>69% - 60%</td> <td>< 60%</td> </tr> </tbody> </table>					Service Level					A	B	C	D	F	100% - 90%	89% - 80%	79% - 70%	69% - 60%	< 60%
Service Level																				
A	B	C	D	F																
100% - 90%	89% - 80%	79% - 70%	69% - 60%	< 60%																
Comments:	Performance measure is developed, data is being collected (beginning 2006), but reporting is on hold.																			
Data Source:	Data provided by region Traffic, using form sent to them by MAP personnel.																			

Group 6 - Traffic Control Maintenance and Operations

Activity Number:	6C2	Priority Rank:																
Activity Name:	Highway Lighting Systems Preventive Maintenance																	
Survey Period:	Fall	Detail Level:	Region															
Indicator:	Preventive Maintenance tasks identified.																	
Outcome Measure:	Percent of identified PM's completed																	
Outcome Unit:	% Completed																	
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>100% - 90%</td> <td>89% - 80%</td> <td>79% - 70%</td> <td>69% - 60%</td> <td>< 60%</td> </tr> </tbody> </table>			Service Level					A	B	C	D	F	100% - 90%	89% - 80%	79% - 70%	69% - 60%	< 60%
Service Level																		
A	B	C	D	F														
100% - 90%	89% - 80%	79% - 70%	69% - 60%	< 60%														
Comments:	Performance measure is developed, data is being collected (beginning 2007), but reporting is on hold.																	
Data Source:	Data provided by region Traffic, using form sent to them by MAP personnel.																	

Activity Number:	6C3	Priority Rank:																
Activity Name:	Intelligent Transportation Systems Preventive Maint																	
Survey Period:	Fall	Detail Level:	Region															
Indicator:	Preventive Maintenance tasks identified.																	
Outcome Measure:	Percent of identified PM's completed																	
Outcome Unit:	% Completed																	
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td>100% - 90%</td> <td>89% - 80%</td> <td>79% - 70%</td> <td>69% - 60%</td> <td>< 60%</td> </tr> </tbody> </table>			Service Level					A	B	C	D	F	100% - 90%	89% - 80%	79% - 70%	69% - 60%	< 60%
Service Level																		
A	B	C	D	F														
100% - 90%	89% - 80%	79% - 70%	69% - 60%	< 60%														
Comments:	Performance measure is developed, data is being collected (beginning 2006), but reporting is on hold.																	
Data Source:	Data provided by region Traffic, using form sent to them by MAP personnel.																	

Group 7 - Rest Area Operations

Activity Number:	7B1	Priority Rank:	18																					
Activity Name:	Rest Area Operations																							
Survey Period:	Fall	Detail Level:	Region																					
Indicator:	Cleanliness of building, non-functional building/utility systems (hand dryer, soap dispenser, RV dump station), appearance of landscaped areas, and sidewalks and pavement.																							
Outcome Measure:	Condition score. See MAP Rest Area Survey Form.																							
Outcome Unit:	Score																							
Outcome Thresholds:	<table border="1"> <thead> <tr> <th colspan="5">Service Level</th> </tr> <tr> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>F</th> </tr> </thead> <tbody> <tr> <td><5</td> <td>6 - 9</td> <td>10 - 13</td> <td>14 - 17</td> <td>>17</td> </tr> <tr> <td>< <5</td> <td colspan="4"></td> </tr> </tbody> </table>				Service Level					A	B	C	D	F	<5	6 - 9	10 - 13	14 - 17	>17	< <5				
Service Level																								
A	B	C	D	F																				
<5	6 - 9	10 - 13	14 - 17	>17																				
< <5																								
Comments:																								
Data Source:	Data provided by HQ surveys.																							

Group 8 - Training and Testing

Activity Number:	8B1	Priority Rank:			
Activity Name:	Employee Technical and Safety Training				
Survey Period:		Detail Level:			
Indicator:	None				
Outcome Measure:	None				
Outcome Unit:	None				
Outcome Thresholds:	Service Level				
	A	B	C	D	F
Comments:					
Data Source:					

Activity Number:	8B2	Priority Rank:			
Activity Name:	Support and Testing				
Survey Period:		Detail Level:			
Indicator:	None				
Outcome Measure:	None				
Outcome Unit:	None				
Outcome Thresholds:	Service Level				
	A	B	C	D	F
Comments:					
Data Source:					

Group 9 - 3rd Party Damage Repairs and Disaster Operations

Activity Number:	9B1	Priority Rank:																
Activity Name:	3rd Party Damages																	
Survey Period:		Detail Level:																
Indicator:	None																	
Outcome Measure:	None																	
Outcome Unit:	None																	
Outcome Thresholds:	<table><tr><th colspan="5">Service Level</th></tr><tr><th>A</th><th>B</th><th>C</th><th>D</th><th>F</th></tr><tr><td></td><td></td><td></td><td></td><td></td></tr></table>			Service Level					A	B	C	D	F					
Service Level																		
A	B	C	D	F														
Comments:																		
Data Source:																		

Activity Number:	9B2	Priority Rank:	2															
Activity Name:	Disasters																	
Survey Period:		Detail Level:																
Indicator:	None																	
Outcome Measure:	None																	
Outcome Unit:	None																	
Outcome Thresholds:	<table><tr><th colspan="5">Service Level</th></tr><tr><th>A</th><th>B</th><th>C</th><th>D</th><th>F</th></tr><tr><td></td><td></td><td></td><td></td><td></td></tr></table>			Service Level					A	B	C	D	F					
Service Level																		
A	B	C	D	F														
Comments:																		
Data Source:																		

Chapter 5

Service Level

The Maintenance Accountability Process (MAP) utilizes a simple scale that rates the outcomes of key maintenance activities based on the following criteria:

Service Level A (Best)

This is a very high service level in which the roadway and associated features are in excellent condition. All systems are operational and users experience no delays.

At this maintenance service level, very few deficiencies are present and the overall appearance is pleasing. Preventive maintenance is practiced in all maintenance activities resulting in overall low life-cycle costs and pleasing appearance. Routine activities take place on a regular basis, requiring minimal corrective maintenance activities.

Service Level B

This is a high maintenance service level in which the roadway and associated features are in good condition. All systems are operational. Users may experience occasional delays.

At this maintenance service level, very few deficiencies are present in safety and investment protection activities, but moderate deficiencies exist in all other areas. Preventive maintenance is practiced for safety-related work, is deferred in other areas, resulting in additional routine and corrective maintenance measures. Corrective maintenance of all elements is handled in a timely manner. Life-cycle costs for maintenance activities are generally low.

Service Level C

This is a medium maintenance service level in which the roadway and associated features are in fair condition. Systems may occasionally be inoperable and not available to users. Short term delays may be experienced when repairs are being made, but would not be excessive.

At this maintenance service level, very few deficiencies are present in safety related activities, but moderate deficiencies exist for investment protection activities and significant aesthetic related deficiencies. Preventive maintenance is deferred for most activities except safety-critical work. More emphasis is placed on routine maintenance activities, and corrective maintenance occurs as necessary. A backlog of deficiencies begins to build up that will have to be dealt with eventually, at a higher cost. Some roadway structural problems begin to appear due to the long-term deterioration of the system. There is a noticeable decrease in appearance.

Service Level D

This is a low maintenance service level in which the roadway and associated features are kept in generally poor condition. Systems failures occur regularly because it is impossible to react in a timely manner to all problems. Occasionally delays may be significant.

At this maintenance service level, moderate deficiencies are present in safety related activities, and significant deficiencies exist for all other activities. Little preventive maintenance is accomplished. Maintenance has become very reactionary and places emphasis on correcting problems as they occur. A significant backlog of deficiencies will begin to build up that will have to be dealt with eventually, at a much higher cost. . Safety problems begin to appear that increase risk and liability, and significant roadway structural deficiencies exist that accelerate the long-term deterioration of the system. The overall appearance is very poor.

Service Level F (Worst)

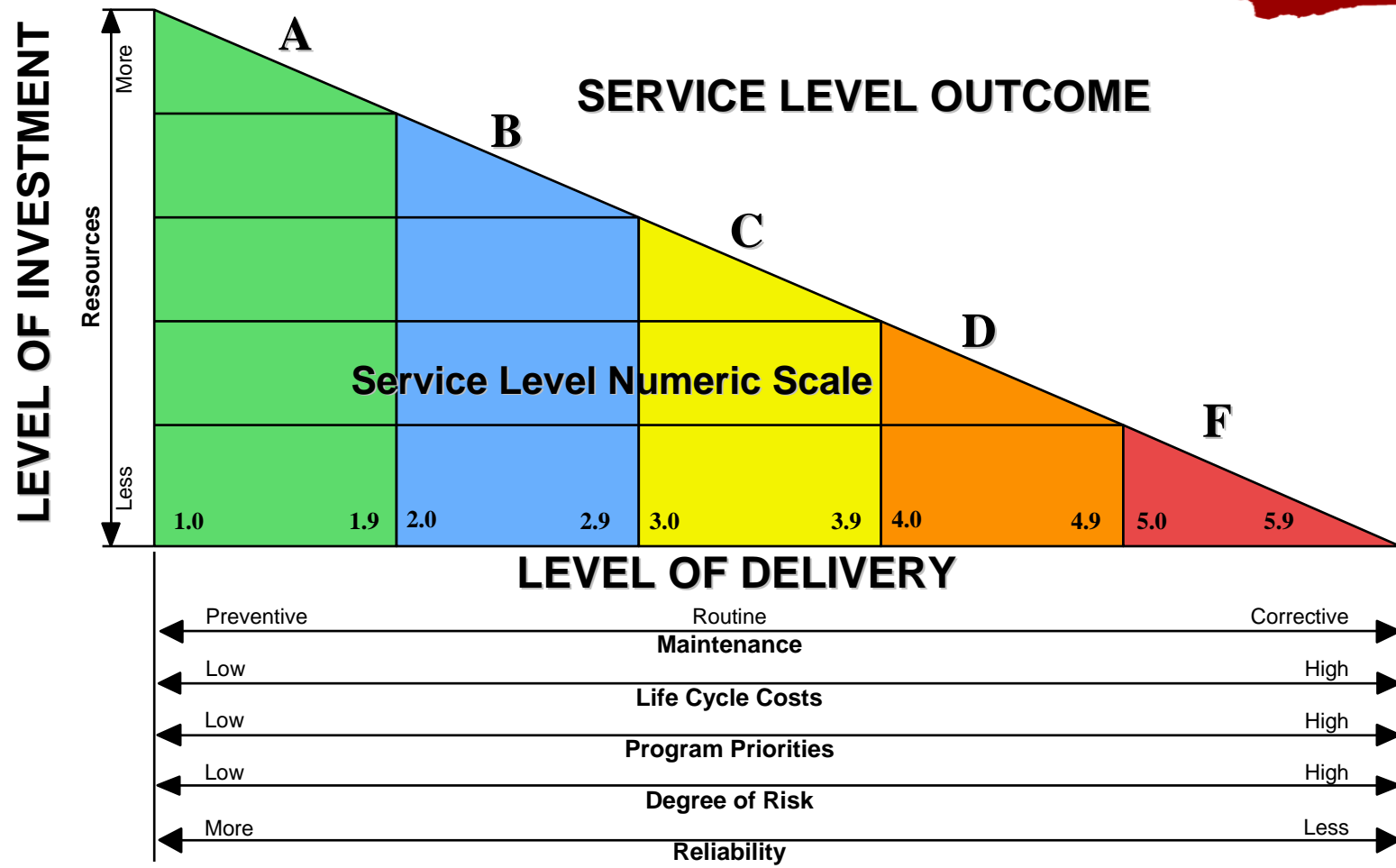
This is a very low service level in which the roadway and associated features are kept in poor and failing condition. A backlog of systems failures would occur because it is impossible to react in a timely manner to all problems. Significant delays occur on a regular basis.

At this maintenance service level, significant deficiencies are present in all maintenance activities. The overall appearance is not aesthetically pleasing. Preventive maintenance is not practiced for any maintenance activities. Maintenance is totally reactive, and places emphasis on correcting problems after they occur. Significant backlogs of maintenance deficiencies exist. Excessive safety problems occur. Road conditions are such that maintenance treatments are not enough to correct the deficiencies that exist, necessitating additional high-cost remedial construction preservation projects in the future. Overall maintenance operations are at their highest life-cycle costs.

The chart on the following page gives a pictorial view of the relationship between the level of investment, level of delivery and service level outcome. Level of investment means how much money is budgeted. This budget pays for the resources (labor, equipment and materials) required to achieve our goals. More money equals more resources equals a higher LOS; less money equals fewer resources equals a lower LOS.

Following the chart, pictures and narration provide examples of service levels for each group of activities.

Service Level Effectiveness Model



GROUP 1 – Roadway Maintenance and Operations

Service Level - A



Pavement with few unrepaired potholes, ruts, or unsealed cracks. No drop-off at the pavement edge. The shoulder is generally clean and free of debris.

Service Level - B



Pavement has a minor amount of unrepaired potholes, ruts, or unsealed cracks. A minor amount of drop-off and minor erosion is at the pavement edge. The paved shoulder contains a small amount of debris build-up at the edge.

Service Level - C



Pavement has a moderate amount of unrepaired potholes, ruts, or unsealed cracks. A moderate amount of drop-off has developed from at the pavement edge with some erosion. The paved shoulder contains a noticeable debris build-up that may be unsightly.

Service Level - D



Pavement has a significant amount of unrepaired potholes, ruts or unsealed cracks. A significant drop-off has developed at the pavement edge with noticeable erosion. The paved shoulder contains significant debris that would restrict bicycle or pedestrian use, and be unsightly.

Service Level - F



Pavement has an extensive amount of unrepaired potholes, ruts, or unsealed cracks. Extensive erosion or drop-off has developed at the pavement edge. The paved shoulder contains debris build-up that would prevent bicycle and pedestrian use, be a hazard to vehicles, and be unsightly.

GROUP 2 – Drainage Maintenance and Slope Repair

Service Level - A



Ditches and culverts flow freely. Storm drains are free of blockages, and slopes are stable. No standing water on pavement.

Service Level - B



Ditches and culverts have minor silt and debris build-up. Storm drains have minor blockages. Minor puddling may occur during normal storm events.

Service Level - C



Ditches and culverts have moderate silt and debris build-up. Storm drains have moderate blockages and slopes have moderate erosion or slides. There may be some standing water on shoulder and in ditches during major storm events.

Service Level - D



Ditches and culverts have significant silt and debris build-up. Storm drains have significant blockages. Erosion or slides may encroach or threaten the roadway. Standing water in traveled lane during normal storm event.

Service Level - F



Ditches and culverts have extensive silt and debris build-up. Drains are blocked. Erosion and slides threaten roadway. Water will be over the roadway during normal storm events.

GROUP 3 – Roadside and Landscape Maintenance

Service Level - A



Roadside has minimal visible litter, no noxious weeds, nuisance vegetation, or vegetation obstructions. Ditch lines, guardrail, signs and sight lines are completely visible.

Service Level - B



Roadside has a minor amount of visible litter, noxious weeds, nuisance vegetation, or vegetation obstructions. Ditch lines, guardrail, signs, and sight lines are slightly obscured by encroaching vegetation.

Service Level - C



Roadside has a moderate amount of visible litter, noxious weeds, nuisance vegetation, or vegetation obstructions. Vegetation is starting to encroach on the pavement edge, moderately obscuring ditch lines, guardrail, signs, and sight lines.

Service Level - D



Roadside has a significant amount of visible litter, noxious weeds, nuisance vegetation, or vegetation obstructions. Vegetation is encroaching on the pavement edge, significantly obscuring ditch lines, guardrail, signs, and sight lines.

Service Level - F



Roadside has an extensive amount of visible litter, noxious weeds, nuisance vegetation, or vegetation obstructions. Vegetation has encroached on the pavement, extensively obscuring ditch lines, guardrail, signs, and sight lines.

GROUP 4 – Bridge and Urban Tunnel Maintenance & Operations

Typical Priority – 1 Bridge Repairs



Concrete is chipping off the deck and portions of the expansion joint are missing.



Drift debris build-up at bridge pier. This can cause undermining of footings.



Concrete is chipping and flaking off girders and piers.







Rotted timbers of the support structure.



Damaged bridge railing and barrier.

GROUP 5 – Snow and Ice Control Operations

Expected Season LOS	Expected Road Condition after Treatment Completed
A to B	<p>Snow or ice buildup encountered rarely. Bare pavement attained as soon as possible. Travel delays rarely experienced.</p> 
B To C	<p>Snow or ice build up encountered at times but infrequent. Travel at times may experience some isolated delays with roads having patches of black ice, slush, or packed snow.</p> 
C to D	<p>Snow or ice buildup encountered regularly. Travel likely to experience some delays with roads having black ice or packed snow with only the wheel track bare.</p> 
D to F	<p>Compact snow buildup encountered regularly. Traveler will experience delays and slow travel.</p> 
N/A	<p>Closed periodically or for the duration of the winter season.</p>

GROUP 6 – Traffic Control Maintenance & Operations

Service Level - A



All stripes, signs and delineators are highly visible at night. All traffic signal, lighting, and other traffic operations systems are fully functional. Guardrail is sound and functional.

Service Level - B



Minor amount of stripes, signs and delineators have lost some night reflectivity, are worn or missing. Some traffic signal, lighting and other traffic operation systems experience minimal outages or down time. Guardrail has sustained minor visible damage, but is functionally sound.

Service Level - C



Moderate amount of stripes, signs and delineators have lost some night reflectivity, are worn or missing. Some traffic signal, lighting and other traffic operations systems experience moderate outages or down time. Guardrail is functionally sound, but sustained moderate visible damage and some structural deterioration.

Service Level - D



Significant amount of stripes, signs and delineators have lost night reflectivity, are worn or missing. Some traffic signal, lighting and other traffic operations system must be turned off or shut down. Guardrail has sustained significant visible damage and moderate structural deterioration.

Service Level - F



Extensive amount of stripes, signs and delineators have lost night reflectivity, are worn or missing. Significant traffic signal, lighting, and other traffic operations systems must be turned off or shut down. Guardrail has sustained extensive visible and structure damage.

GROUP 7 – Rest Area Operations

Service Level - A



Rest rooms cleaned regularly to meet the highest standard for cleanliness. Water and sewer systems comply with current codes. All building facilities are functional, painted and free of graffiti. Site is free of litter. Grounds are neat and manicured.

Service Level - B



Rest rooms cleaned regularly as much as 2-3 times a day to meet most standards for cleanliness. Water and sewer systems comply with current codes. Buildings contain minor functional damage and some graffiti. Site contains a minor amount of litter. Grounds are clean but exhibits minor wear and damage.

Service Level - C



Rest rooms are cleaned regularly 1-2 times a day to meet moderate standards for cleanliness except in rest areas that receive the highest use. Water and sewer systems comply with current codes, but experience some breakdowns due to aging and wear. Buildings contain moderate functional damage and graffiti. Site contains a moderate amount of litter. Grounds exhibit moderate wear and damage.

Service Level - D



Rest rooms are cleaned only once a day to meet minimal standards for cleanliness except in rest areas that receive the highest use. Water and sewer systems comply with current codes, but experience frequent breakdowns forcing short term rest area closures. Buildings contain significant functional damage and graffiti. Site contains a significant amount of litter. Grounds exhibit significant wear and damage.

Service Level - F



Due to building, water or sewer system deficiencies, some rest areas are closed for extended periods. Portable toilets may be the only service provided. Grounds contain significant defects and extensive litter.

Chapter 6

Planning

Maintenance Activity Priorities

Maintenance activities are prioritized according to their impact upon specific policy objectives. The objectives are:

- Safety of Traveling Public and Employees
- Operation of the Highway System, keeping the road open
- Meeting Environmental Responsibilities
- Maintaining the Infrastructure
- Addressing Legal Mandates other than Environmental (including torts)
- Contributing to comfort, aesthetics or convenience

A 0 to 9 scale (9 being highest impact) is used to rate the impact of each maintenance activity on each policy objective. Each policy objective is represented by a multiplier. When the math is done, a numerical priority value is obtained. Priorities are set using these values, highest to lowest.

Page 6-2 contains the 2007-2009 Priority Matrix. Current biennium matrixes can be found at

<http://www.wsdot.wa.gov/maintenance/mgmt/accountability.htm>.

2007-2009 Maintenance Activities

Priority and Level of Service Matrix

STATEWIDE MAP PRIORITIES					Policy Objectives										Total Priority		
					05-07 Actual Dollars (Millions) (through July 2007 and 25th month)		2006 LOS Delivered	07-09 LOS Target	Safety of Travelling Public and Employees		Operate the Highway System and Keep the Road Open		Meet Environmental Responsibilities			Maintaining the Infrastructure	
Num.	MAP Activity				10		9		7		7		7		2		
4B1	Movable & Floating Bridge Operations	\$6.5	A	B+	6	60	9	81	6	42	9	63	9	63	6	12	321
9B2	Disaster Operations	\$8.0			9	90	9	81	9	63	9	63	3	21	0	0	318
6B1	Traffic Signal System Operations	\$9.5	C-	C+	9	90	9	81	3	21	6	42	9	63	3	6	303
5B1	Snow & Ice Control Operations	\$59.6	A-	A-	9	90	9	81	6	42	0	0	9	63	9	18	294
4B2	Keller Ferry Operations	\$1.1	B	B	3	30	9	81	3	21	9	63	9	63	6	12	270
4B3	Urban Tunnel Systems Operations	\$3.4	B	B	3	30	6	54	3	21	9	63	9	63	6	12	243
4A2	Structural Bridge Repair	\$8.7	C+	C	6	60	3	27	6	42	9	63	6	42	3	6	240
6A4	Regulatory/Warning Sign Maintenance	\$2.5	B-	C+	9	90	6	54	0	0	3	21	9	63	6	12	240
2A5	Slope Repairs	\$4.4	A	B	6	60	6	54	6	42	6	42	3	21	3	6	225
6B3	Intelligent Transportation Systems(ITS)	\$4.8	C+	B-	6	60	9	81	3	21	6	42	0	0	9	18	222
2A3	Maintain Catch Basins & Inlets	\$3.8	B+	B	6	60	6	54	6	42	6	42	3	21	0	0	219
1A1	Pavement Patching & Repair	\$22.0	A-	B	6	60	3	27	3	21	9	63	6	42	3	6	219
4A1	Bridge Deck Repair	\$1.5	A-	B-	6	60	3	27	3	21	9	63	6	42	3	6	219
6A7	Guardrail Maintenance*	\$1.3	A	A	9	90	3	27	0	0	6	42	6	42	3	6	207
6A1	Pavement Striping Maintenance	\$8.8	C+	C+	9	90	6	54	0	0	0	0	6	42	9	18	204
6A2	Raised/Depressed Pavement Markers	\$1.9	B	B	9	90	6	54	0	0	0	0	6	42	9	18	204
3A4	Control of Vegetation Obstructions	\$7.2	A-	B-	9	90	3	27	0	0	3	21	6	42	6	12	192
7B1	Rest Area Operations	\$10.1	B	B	3	30	3	27	6	42	6	42	3	21	9	18	180
1A4	Sweeping and Cleaning	\$7.0	A	B+	3	30	3	27	9	63	3	21	3	21	9	18	180
2A1	Maintain Ditches	\$10.1	A-	B	3	30	3	27	6	42	6	42	3	21	3	6	168
6B2	Highway Lighting Systems	\$10.2	B	B+	6	60	3	27	0	0	6	42	3	21	9	18	168
6A6	Guidepost Maintenance	\$2.4	C	C-	6	60	3	27	3	21	3	21	3	21	9	18	168
1B1	Safety Patrol	\$6.1	C+	C+	9	90	3	27	0	0	3	21	3	21	3	6	165
2A2	Maintain Culverts	\$5.2	C	C	3	30	3	27	6	42	6	42	3	21	0	0	162
6B4	Permits/Franchises	\$2.7			3	30	3	27	3	21	3	21	9	63	0	0	162
6A3	Pavement Marking maintenance	\$2.6	C+	C-	6	60	3	27	0	0	0	0	9	63	6	12	162
3A2	Noxious Weed Control	\$5.0	A	B	0	0	0	0	9	63	3	21	9	63	3	6	153
1A3	Shoulder Maintenance	\$3.1	B	C+	3	30	3	27	3	21	6	42	3	21	3	6	147
6A5	Guide Sign Maintenance	\$4.0	A-	B-	3	30	6	54	0	0	3	21	3	21	9	18	144
2A4	Maintain Detention/Retention Basins	\$0.5	C	C	0	0	0	0	9	63	3	21	6	42	0	0	126
4A3	Bridge Cleaning & painting	\$1.9	B	C	0	0	0	0	9	63	6	42	0	0	6	12	117
3A3	Nuisance Vegetation Control	\$8.8	A	B-	0	0	0	0	6	42	3	21	3	21	9	18	102
3A5	Landscape Maintenance	\$4.3	C-	C-	0	0	0	0	3	21	3	21	3	21	9	18	81
3A1	Litter Pickup	\$6.3	D+	C-	0	0	0	0	3	21	0	0	3	21	9	18	60

New Performance Measures - not yet prioritized														
4C3	Urban Tunnels Preventive Maint		A											
6C1	Traffic Signal Systems Prev. Maint.		A											
6C2	Highway Lighting Systems Prev. Maint.		A											
6C3	ITS Preventive Maintenance		A											

Non-prioritized Support Activities														
8B1	Employee Technical & Safety Training	\$11.9												
8B2	Support and Testing	\$13.0												
*9B1	3rd Party Damages & Repair	\$21.1												

TOTAL \$291.3

* Approximately \$7.0 M expended for guardrail repair in activity 9B1 during 05-07 biennium

LEGEND:

Contribution To Program Goals

- 9 - Critical Impact
- 6 - Significant Impact
- 3 - Contributing Impact
- 0 - No Impact

Data Collection and Reporting

Data is collected in many different ways, depending on which activity is involved. See Chapter 5 for details about each activity, including the data source and when it is collected.

Field Surveys

Field condition surveys are conducted once a year, (beginning in 2008), during the summer months, collecting data for 14 MAP activities. This data is used to assess the maintenance service levels that exist at a given point in time. Each region will have two dedicated survey teams, with two alternates. Surveyors will not collect data in their normally assigned area or section. The teams will collect data according to the criteria in the Field Data Collection Manual (available online at <http://www.wsdot.wa.gov/maintenance/pdf/2007FieldDataCollectionManual.pdf>).

Statistical methods are used to determine the number of surveys needed per region based on the number of centerline miles. Currently the numbers are:

Northwest	372 surveys
North Central	372 surveys
Olympic	371 surveys
Southwest	370 surveys
South Central	371 surveys
Eastern	375 surveys

These numbers are then prorated out per the number of centerline miles in each area and/or section.

A random site generator is used compile a list of sites for each region/section/area. Using the roadway functional class (found in the State Highway Log Planning Report, located online at <http://www.wsdot.wa.gov/mapsdata/tso/statehighwaylog.htm>), the generator compiles the site list to reflect the functional class of total centerline miles. For instance, if 50% of a region/area/section total centerline miles are functional class 5 (interstate), then roughly 50% of the survey sites in that region/area/section would be on functional class 5 highways.

Training is set up by HQ MAP personnel in conjunction with regional maintenance trainers. Training is offered in each region once a year, prior to the field survey period. Half of the training time is spent in the classroom and the other half in the field. Additionally, HQ MAP personnel will spend a minimum of one day with each team within the first two weeks of the survey period, working side by side with the teams as they conduct their surveys.

Quality Control/Quality Assurance

QA/QC surveys are performed by HQ personnel in the same time frame as regional surveys. Beginning in 2008, some of these surveys will be performed alongside the regional surveyors, as they conduct their surveys. QA/QC surveys will be done on approximately 10% of the regional survey sites. The focus of the QA/QC surveys will be to increase the accuracy and consistency of the regional teams' data collection.

Data Input

In 2008, surveyors will have two options for inputting the data collected. A PDA application has been developed and will be the preferred option. The device will be used in the field and downloaded once the surveyors return to the office. Use of the PDA and options for reviewing after download will be covered in the training sessions. GoMAP, the FileMakerPro application will remain available for input and getting a list of the sites until the transition to PDA data collection is complete.

Targets

In the early stages of MAP, targets were established based on initial levels of service achieved. Decisions to adjust targets up or down were made at the discretion of the Regional Maintenance Engineers and the State Maintenance Engineer, again based on history and level of service achieved. This was changed during the 2007 Legislative Session. Legislators' fine tuned the targets and included them in LEAP Transportation Document 2007-C, thereby writing the targets into "legislation". Below are the targets for 2007-2009 as prescribed by the legislature. This document can also be found at <http://www.wsdot.wa.gov/maintenance/mgmt/accountability.htm>.

Maintenance Accountability Process

Activity Service Level Targets

2007 - 2009

	1.0	1.9	2.0	2.9	3.0	3.9	4.0	4.9	5.0	5.9
Activity	+ A -	+ B -	+ C -	+ D -	+ F -					
Group - 1 Roadway Maintenance and Operations										
1A1 Pavement Patching, Repair & Crack Sealing*				⊙						
1A3 Shoulder Maintenance				⊙						
1A4 Sweeping and Cleaning			⊙							
1B1 Safety Patrol					⊙					
Group - 2 Drainage Maintenance and Slope Repair										
2A1 Maintain Ditches				⊙						
2A2 Maintain Culverts						⊙				
2A3 Maintain Catch Basins and Inlets				⊙						
2A4 Maintain Detention/Retention Basins						⊙				
2A5 Slope Repair				⊙						
Group - 3 Roadside and Vegetation Management										
3A1 Litter Pickup							⊙			
3A2 Noxious Weed Control				⊙						
3A3 Nuisance Vegetation Control					⊙					
3A4 Control of Vegetation Obstructions					⊙					
3A5 Landscape Maintenance							⊙			
Group - 4 Bridge and Urban Tunnel Maintenance and Operations										
4A1 Bridge Deck Repair					⊙					
4A2 Structural Bridge Repair							⊙			
4A3 Bridge Cleaning							⊙			
4B1 Movable and Floating Bridge Operations			⊙							
4B2 Keller Ferry Operations				⊙						
4B3 Urban Tunnel Systems				⊙						
4C3 Urban Tunnels Preventive Maintenance**		⊙								
Group - 5 Snow and Ice Control Operations										
5B1 Snow and Ice Control Operations			⊙							
Group - 6 Traffic Control Maintenance and Operations										
6A1 Pavement Striping Maintenance***						⊙				
6A2 Raised/Depressed Pavement Marker Maint.				⊙						
6A3 Pavement Marking Maintenance							⊙			
6A4 Regulatory Sign Maintenance						⊙				
6A5 Guide Sign Maintenance					⊙					
6A6 Guidepost Maintenance							⊙			
6A7 Guardrail Maintenance		⊙								
6B1 Traffic Signal Systems						⊙				
6B2 Highway Lighting Systems			⊙							
6B3 Intelligent Transportation Systems					⊙					
6C1 Traffic Signal Systems Preventive Maint.**		⊙								
6C2 Highway Lighting Systems Prev. Maint.**		⊙								
6C3 Intelligent Transportation Sys. Prev. Maint.**		⊙								
Group - 7 Rest Area Operations										
7B1 Rest Area Operations					⊙					

** New Performance Measure

Key

- ⊙ Current Law Budget Service Level Commitment
- ✓ Service Level Currently Delivered by WSDOT

Service Level Rating

Once all data is collected from the field surveys and other sources, it is processed by HQ MAP personnel. This involves gathering all data from all sources, validating the data (example: numbers deficient cannot exceed total on site), importing all data into the MAP database and performing all calculations to arrive at the outcome unit (i.e. % deficient, linear feet of deficiencies per lane mile – see MAP activities in Chapter Five for more detail). After the outcome unit is achieved, further calculations are performed to arrive at a numerical score, with 1 being the highest, which then equates to a letter score (shown on the following chart).

Service Level	A			B			C		
Letter Rating	A+	A	A-	B+	B	B-	C+	C	C-
Numeric Rating	1.0- 1.25	1.26- 1.75	1.76- 1.99	2.0- 2.25	2.26- 2.75	2.75- 2.99	3.0- 3.25	3.26- 3.75	3.75- 3.99
Service Level	D			F					
Letter Rating	D+	D	D-	F+	F	F-			
Numeric Rating	4.0- 4.25	4.26- 4.75	4.76- 4.99	5.0- 5.25	5.26- 5.75	5.76- 5.99			

Reporting

Reports are created using the numerical and alpha scores created from the gathered data. Preliminary reports are sent out to the regions/areas/sections for review, any errors are corrected, and then final reports are printed. All reports from 2004 to present can be found at

<http://www.wsdot.wa.gov/maintenance/mgmt/accountability.htm>.

Reports compiled and data collected are used in conjunction with the Priority Matrix, for the budgeting and planning of required maintenance activities. This process is a continual one that identifies what needs to be done and what the cost will be, balanced with priorities and allocated funds, then comes full circle back around to data collection and processing, to report the level of service provided within the priorities set and dollars allocated. See 2007 Statewide report below.

Maintenance Accountability Process

Activity Service Level Targets and Service Levels Delivered

Statewide - CY 2007

Activity	1.0 +	1.9 A	2.0 +	2.9 B	3.0 +	3.9 C	4.0 +	4.9 D	5.0 +	5.9 F
Group - 1 Roadway Maintenance and Operations										
1A1 Pavement Patching, Repair & Crack Sealing				⊙	✓					
1A3 Shoulder Maintenance				✓⊙						
1A4 Sweeping and Cleaning			✓⊙							
1B1 Safety Patrol				✓	⊙					
Group - 2 Drainage Maintenance and Slope Repair										
2A1 Maintain Ditches				✓⊙						
2A2 Maintain Culverts						⊙		✓		
2A3 Maintain Catch Basins and Inlets				⊙				✓		
2A4 Maintain Detention/Retention Basins						✓⊙				
2A5 Slope Repair			✓	⊙						
Group - 3 Roadside and Vegetation Management										
3A1 Litter Pickup							⊙			✓
3A2 Noxious Weed Control			✓	⊙						
3A3 Nuisance Vegetation Control			✓	⊙						
3A4 Control of Vegetation Obstructions				⊙	✓					
3A5 Landscape Maintenance							⊙	✓		
Group - 4 Bridge and Urban Tunnel Maintenance and Operations										
4A1 Bridge Deck Repair					⊙	✓				
4A2 Structural Bridge Repair						⊙		✓		
4A3 Bridge Cleaning				✓		⊙				
4B1 Movable and Floating Bridge Operations	✓		⊙							
4B2 Keller Ferry Operations				✓⊙						
4B3 Urban Tunnel Systems				✓⊙						
Group - 5 Snow and Ice Control Operations										
5B1 Snow and Ice Control Operations		✓	⊙							
Group - 6 Traffic Control Maintenance and Operations										
6A1 Pavement Striping Maintenance					⊙	✓				
6A2 Raised/Recessed Pavement Marker Maint.				⊙		✓				
6A3 Pavement Marking Maintenance						⊙		✓		
6A4 Regulatory Sign Maintenance					⊙			✓		
6A5 Guide Sign Maintenance				✓⊙						
6A6 Guidepost Maintenance						⊙		✓		
6A7 Guardrail Maintenance	✓⊙									
6B1 Traffic Signal Systems					⊙	✓				
6B2 Highway Lighting Systems			⊙					✓		
6B3 Intelligent Transportation Systems				✓	⊙					
Group - 7 Rest Area Operations										
7B1 Rest Area Operations				✓⊙						

Scores calced using raw data

Key

- ⊙ Current Law Budget Service Level Commitment
- ✓ 2007 Service Level Delivered
- ⊙ Missed target

1/23/2008

Inventories

As the MAP has evolved, it has become apparent that inventories should play a major role in planning and execution of this process. Unfortunately, a complete inventory of all WSDOT features does not exist at this time. Existing inventories used for MAP are:

Signal Maintenance Management System (SIMMS) – contains all location, preventive maintenance and repair information for Signals, Intelligent Transportation Systems (ITS) and Illumination.

Traffic Sign Management System (TSMS) – contains sign location info, sign description info, sign materials, post materials, and maintenance history (reasons and actions).

MPET – contains all information for Urban Tunnels, all movable bridges, plus the two Tacoma Narrows Bridges, per the Operating Manuel for each bridge, including schedules and completion of preventive maintenance tasks and all repairs. A pilot project is underway in South Central Region, to evaluate the use of MPET for fixed bridges.

The Bridge Preservation Office has a database containing information (location, type of structure, inspections, maintenance reports and much more) for all bridges statewide. A pilot project is in development between BPO and MPET, to allow the exchange of information from the Bridge Repair List that will permit the bridge crews to access their work requirements much quicker and provide the results back to BPO in a more expedient manner.

Databases in development:

The Roadside Features Inventory Program (RFIP) is a program for collecting, storing and reporting highway features, with a focus on fixed objects within the clear zone. Find out more at:
http://www.wsdot.wa.gov/mapsdata/tdo/rfip/RFIP_Resources.htm

The Culvert Maintenance Management System (CMMS) is being developed, in conjunction with RFIP, for better management of culverts. RFIP will contain the location and some attributes of the culvert (size, construction material, etc) and CMMS will contain all inspection, cleaning and repair details.

MAP Team

The MAP Team consists of representatives from each region and HQ. Current members of the MAP Team are:

Headquarters	Rico Baroga Tom Clay Anna Zaharris
Northwest:	Pat Moylan Gary Ward
North Central	Debbi Achord Wayne Rice
Olympic	Ron Bashon Neil Beckman Tom Gibbs
Southwest	John Nisbet Gene Dotson
South Central	John Hagadorn Jim Henderson Tom Lenberg
Eastern	Todd Trepanier Ernie Sims

The team meets as often as the need requires, but should meet a minimum of once a year.

Change Process

The process for changes to MAP activities has been defined. Suggestions are made, the MAP Teams discusses and if the majority of the team agrees, a recommendation is written and presented to the Maintenance Engineers for approval or rejection.

Suggestions can be contributed by anyone, simply by filling out the MAP Team Change Request Form (see page 7-9), identifying the requested change, the reason for the change and all benefits to be gained from the change. All contributions are considered and responded to.

MAP Team Change Request Form

Submitted by: _____ **Date:** _____

Requested Change:

Reason for Change:

Benefit of the Change:
